Vol. 37 Toronto, November 28, 1923 No. 48

Contract Record and Engineering Review

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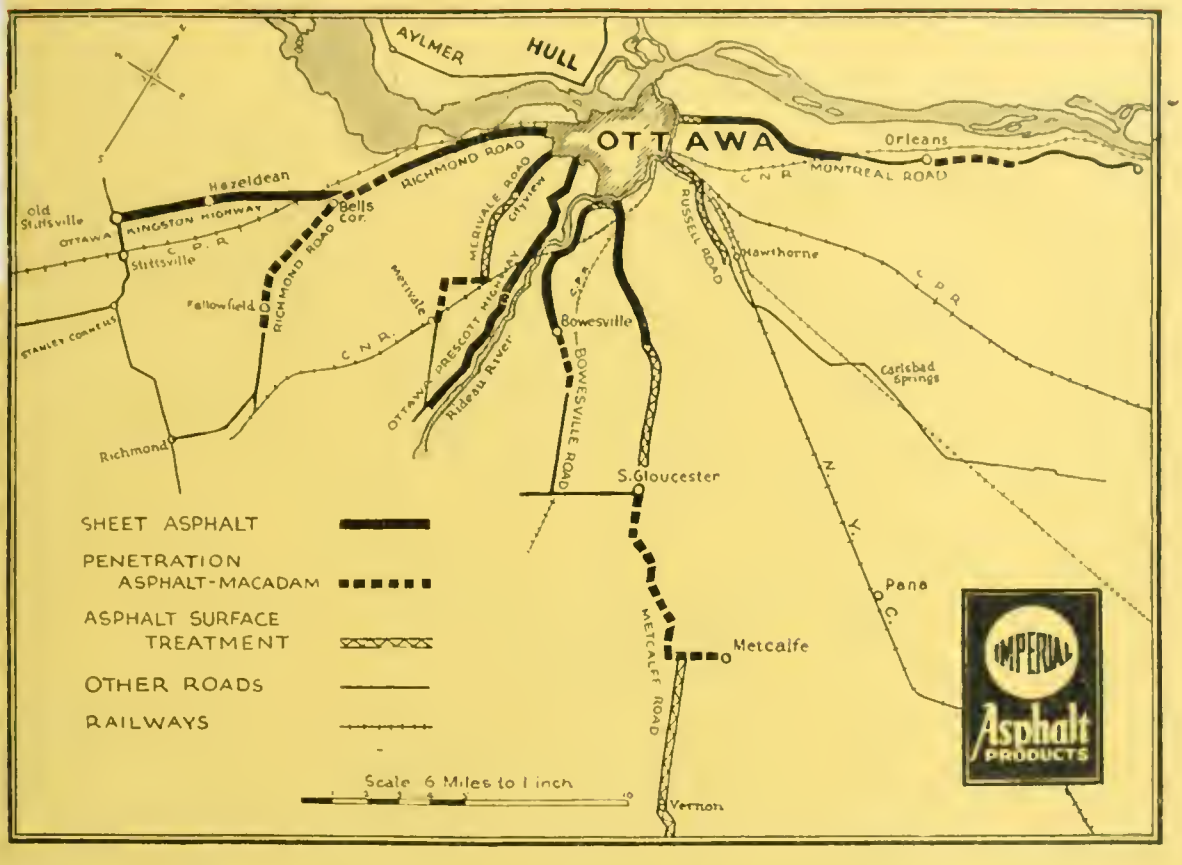


75 Miles of Asphalt Roads Serving Ottawa Suburban Districts

Three years ago the main roads out of Ottawa were in the hands of toll companies and were in bad condition. The Ottawa Suburban Area Roads Commission was then formed, and an active road improvement programme has since been maintained, both by the Commission and the Provincial Government.

The general plan has been to build first as many miles as possible of water-bound macadam roads, to serve the greatest area with the least financial outlay. These roads were maintained with bituminous surface treatments until, as traffic increased, they have been surfaced with Sheet Asphalt or Penetration Asphalt Macadam, according to their importance.

Road improvements along these lines are sound, because all investments are carefully conserved, and a maximum mileage of first-class roads is thus obtained at a minimum cost.

We have prepared a special illustrated folder dealing at greater length with the roads serving Ottawa Suburban Districts. We shall be glad to send you a copy on request.

ROAD ENGINEERING DEPARTMENT

Imperial Oil Limited

Toronto Canada

Alphabetical Index to Advertisers Page 16 Classified Directory to Advertisements Page 6

WOOD PIPE HAS BEEN PERFECTED

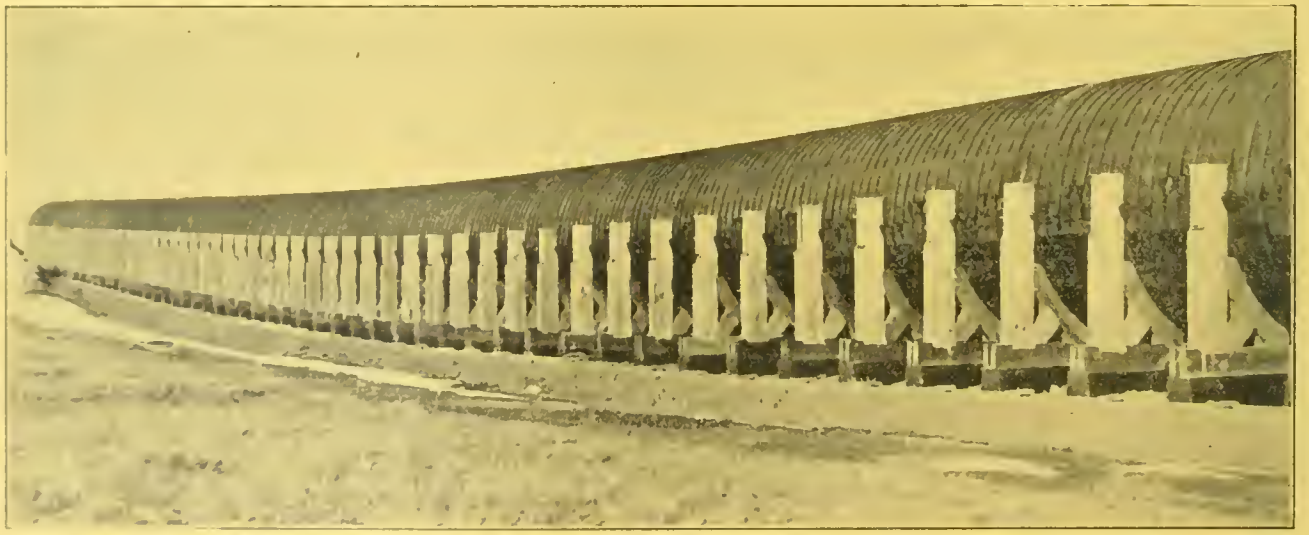
EFFICIENCY!
Steel
Double-Coupling
eliminates
all leaks

DURABILITY!
Double
Burlap Jacket
secures permanency
in all soils

TWO MILES of GOOD PIPE for the PRICE of ONE

Those who cling to the theory that a combination of efficiency and durability is possible only with Metal Pipe at a fancy price, have not fully investigated the improved standard of Wood Pipe. RESULTS in several Western Municipalities are most convincing.

WIRE-WOUND WOOD STAVE PIPE
CONTINUOUS STAVE PIPE
WOODEN TANKS
SILOS

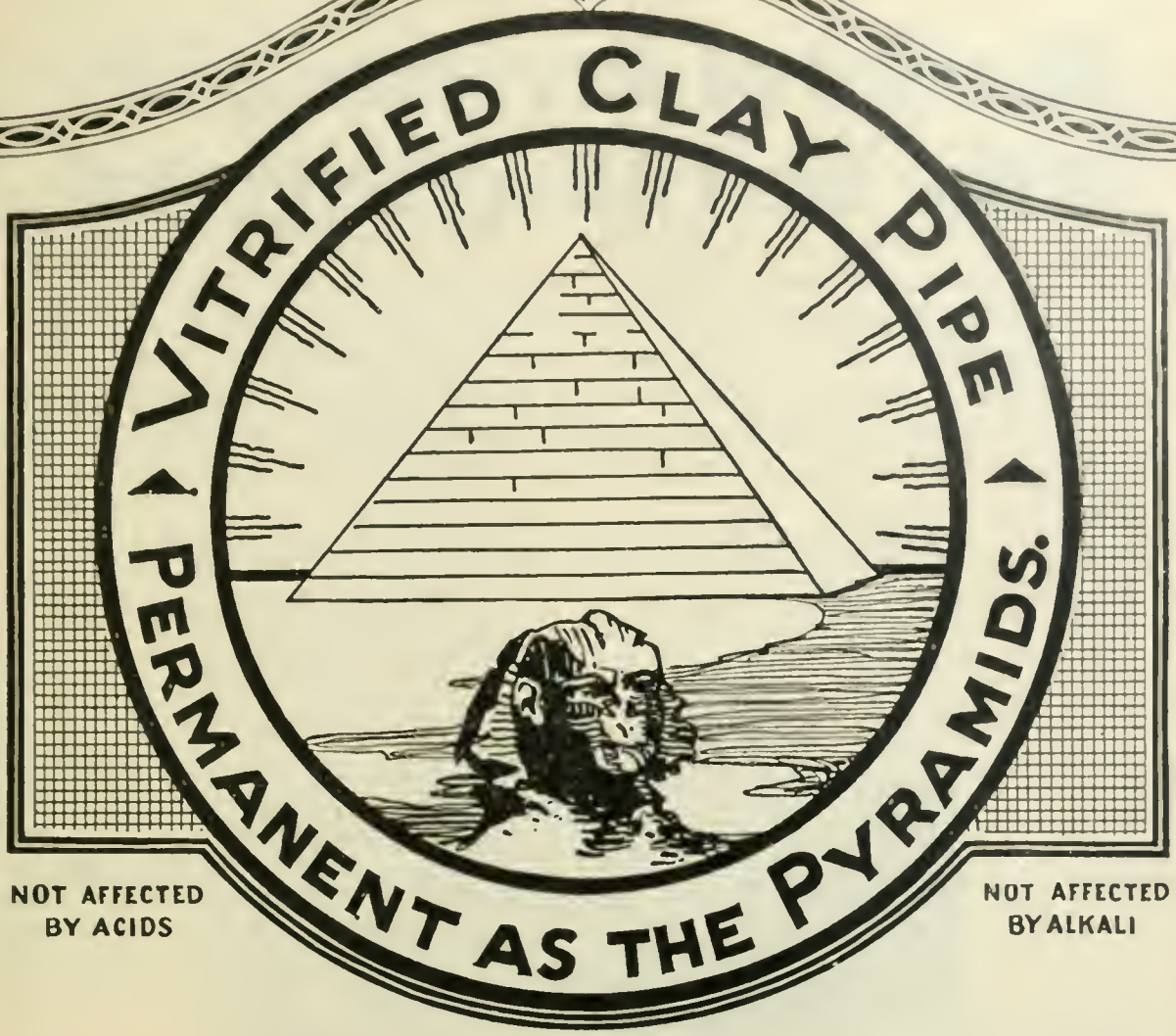


Continuous-Stave Pipe, 10½ feet in diameter, built by us for Lethbridge Northern Irrigation District (Alberta)

Let us quote on your requirements—Catalogue forwarded on request.

CANADIAN PIPE COMPANY, LIMITED

550 Pacific St., VANCOUVER, B.C.



The largest cities in the world construct their sewer systems of Vitrified Clay Pipe. Those that have tested substitute materials most extensively have returned to the use of Vitrified Clay Pipe exclusively because it has proven to be the most permanent, and therefore the most economical material.

Performance is better than promise

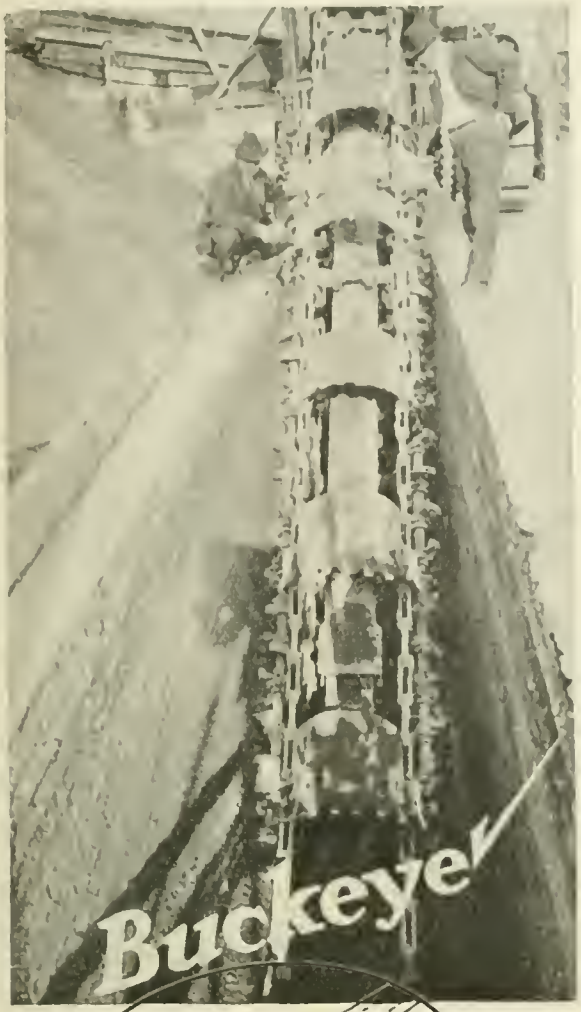
Vitrified Clay Pipe Publicity Bureau. 9 Wellington St. East, Toronto
St. Johns, P. Q. New Glasgow, N. S.

Record of Performance is the Best Advertisement

The structural steel framework for the new Bell Telephone Co. Building, Toronto, is shown herewith. In the background of the illustration may be seen four of the largest buildings in the British Empire, the King Edward Hotel, the Royal Bank, the C. P. R. and Dominion Bank Buildings, all of which are monumental tributes to the world-wide record of structural steel.

BUILD WITH STRUCTURAL STEEL

Issued by the
Structural Steel Association



A Buckeye Cuts Nearly Any Width

A dream that is now a reality. A cutting range that makes it possible to dig trench of practically any desired width with only one Buckeye.

The new Rotary Auxiliary Cutter gives the C-10 a range from 24 to 44 in., the C-15, from 24 to 60 in., the C-20, from 40 to 76 in.

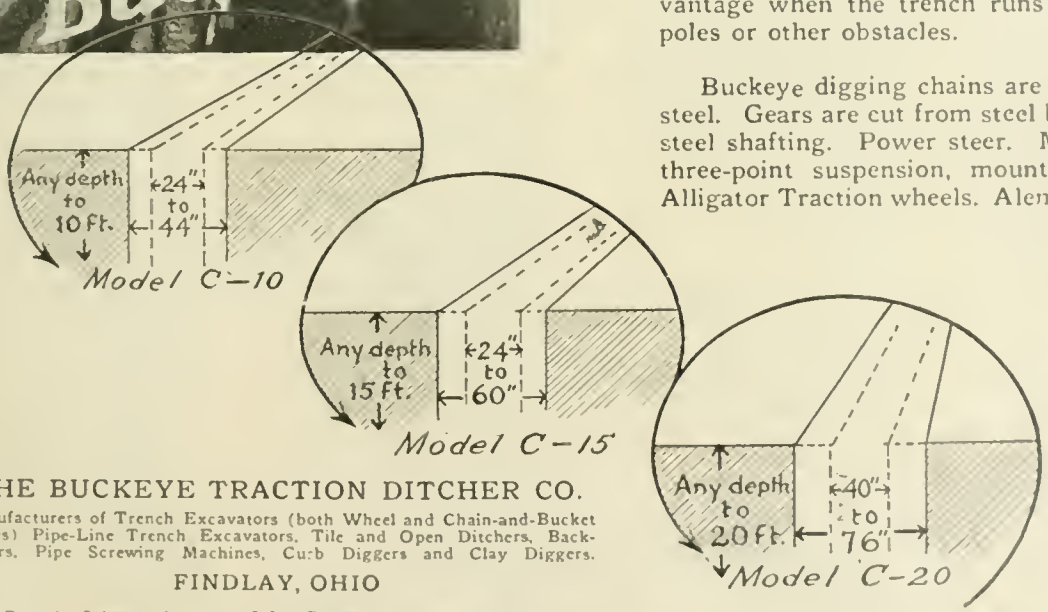
Any width within these wide limits. The cutting width is adjustable—in a few hours the change is made—and your Buckeye is ready to go.

When you buy a new Trencher, be sure to have this advantage.

Many Buckeye Features

When you want to shoot the dirt out the other side, the Buckeye Quick Shift Conveyor gives instant change of delivery. A big advantage when the trench runs close to trees, poles or other obstacles.

Buckeye digging chains are special electric steel. Gears are cut from steel blanks. Chrome steel shafting. Power steer. Main frame has three-point suspension, mounted on Buckeye Alligator Traction wheels. Alemite lubrication.



Let us show you why Buckeyes dig big yardage in any soil—and do it year after year. Send the coupon—no obligation.

THE BUCKEYE TRACTION DITCHER CO.

Manufacturers of Trench Excavators (both Wheel and Chain-and-Bucket Types) Pipe-Line Trench Excavators, Tile and Open Ditchers, Back-Fillers, Pipe Screwing Machines, Curb Diggers and Clay Diggers.

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Branch Sales and Service Office: J. W. Sands, Chatham, Ontario

Sales Representative: The General Supply Company of Canada, Ltd. 85 Water Street Winnipeg, Manitoba

John Birch & Co. Ltd., 2 London Wall Buildings, London, E. C. 2, England

You'll always be glad you bought a **Buckeye**

THE BUCKEYE TRACTION DITCHER COMPANY
Findlay, O[illegible]

Tell me all about Buckeye
Excavators Back-Fillers

Name

Address

CLASSIFIED INDEX TO ADVERTISEMENTS

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Canadian Blower & Forge Co.
Sturtevant, B. F. & Co.

Air Compressors
Canadian Ingersoll-Rand Co.

Air Washers
Canadian Blower & Forge Co.
Sturtevant, B. F. & Co.

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MacKinnon Steel Company
Sarnia Bridge Company

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Industrial Works

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Vitrified Clay Pipe Publicity Bureau

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(Continued on page 8)

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Why?

Because it is efficient, economical and easy to use. The facts are yours for the asking.

Dominion Tar and Chemical Co., Limited

Canada Cement Bldg.
MONTREAL

Foot of Bathurst Street
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Plants at Sydney, N. S., Sault Ste. Marie, Ont., and Montreal, Que.

"THE NATIONAL BITUMEN"

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Sturtevant, B. F. & Co.

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Hunt & Co., Robt. W.
Milton Hersey Company
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Canadian Equipment Co.
Canadian Mead-Morrison Co.
Clyde Iron Works Sales Co.
Engineering & Machine Works of Canada Ltd.
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Hopkins & Co., Ltd., F. H.
Koehring Co., of Canada
Lumsden Engineering & Contracting Co.
Mussens Limited
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Clyde Iron Works Sales Co.
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Hamilton Bridge Works Co.

Joist Hangers
Hamilton Bridge Works Co.

Kilns
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Dominion Bridge Co., Ltd.
MacKinnon Steel Company

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Standard Lime Co.

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Ball Engine Co.
Canadian Austin Machinery
Canadian Equipment Co.
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Erie Steam Shovel Co.
General Products Co.
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Koehring Co., of Canada
McGovern, T. J.
Mussens Limited
Orton & Steinbrenner Co.

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Canadian Equipment Co.

Locomotive Gasoline and Storage Battery
Canadian Austin Machinery
Fate-Root-Heath Co.
F. H. Hopkins & Co., Ltd.
Jeffrey Manufacturing Co.
Koehring Co., of Canada

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Oakley & Sons, Geo.

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Jenkins Bros. Ltd.

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General Products Co.
Ormsby Company, A. B.

Meters
Builders Iron Foundry

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Dominion Bridge Co., Ltd.
Hamilton Bridge Works Co.
Horton Steel Works, Ltd.
Inglis Co., John
MacKinnon Steel Company

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F. H. Hopkins & Co., Ltd.
Orton & Steinbrenner Co.

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Dennis Wire & Iron Works Co.
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Imperial Oil Company, Ltd.
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Pacific Coast Pipe Co.
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De Giorgio, Limited

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Luxfer Prism Co.

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Canadian Ingersoll Rand Co.
Canadian Mead-Morrison Co.
Cook, A. D.
Fuller & Johnson Mfg. Co.
General Products Co.
Goldie & McCulloch Co.
Hepburn, Ltd., John T.
Hopkins & Co., Ltd., F. H.
Inglis Co., John
Koehring Co., of Canada
London Concrete Machry. Co.
Mussens Limited
Waterous Engine Works Co.

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Jenkins Bros. Ltd.
Canadian Ingersoll-Rand Co.

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Hopkins & Co., Ltd., F. H.
McGovern, T. J.
Mussens Limited

Rails
Gartshore, John J.
Hopkins & Co., Ltd., F. H.
Mussens Limited

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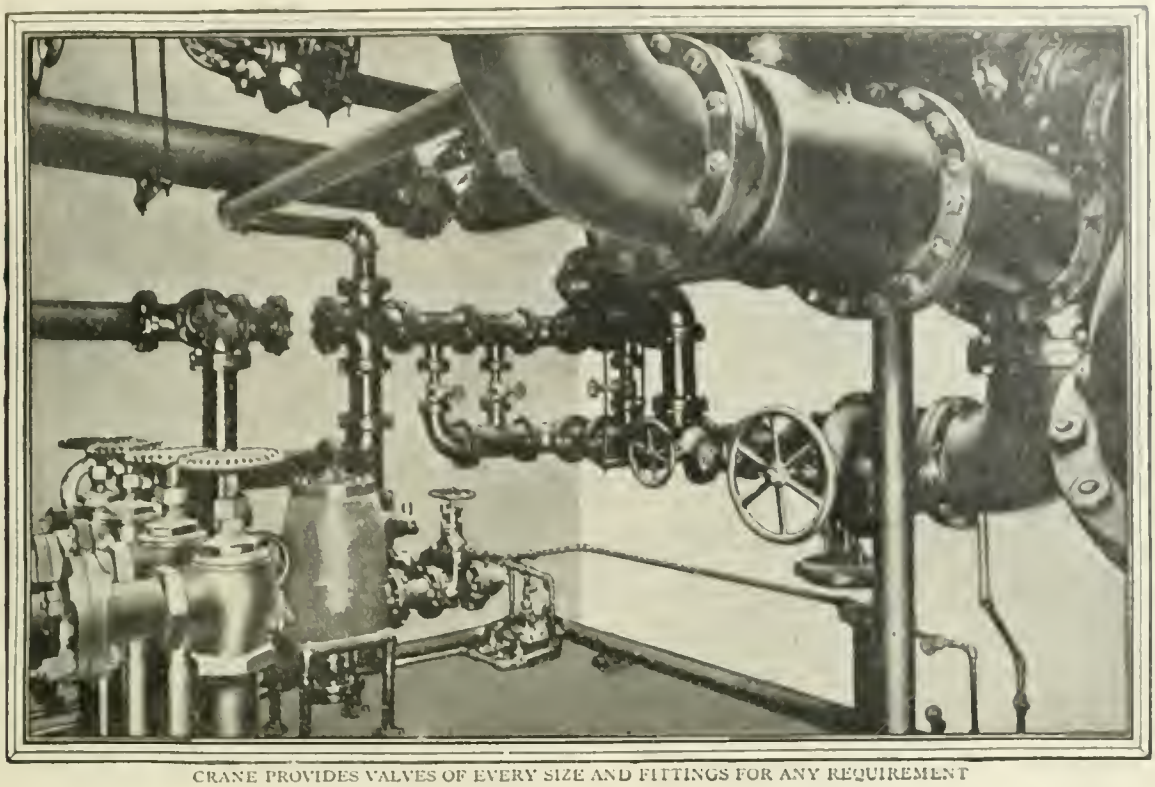

CRANE PROVIDES VALVES OF EVERY SIZE AND FITTINGS FOR ANY REQUIREMENT

CRANE PIPING FOR ANY INSTALLATION

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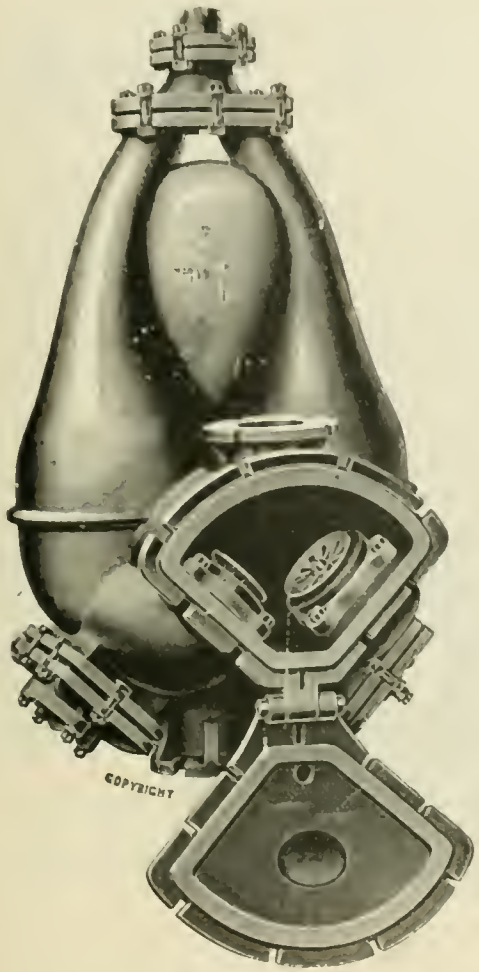

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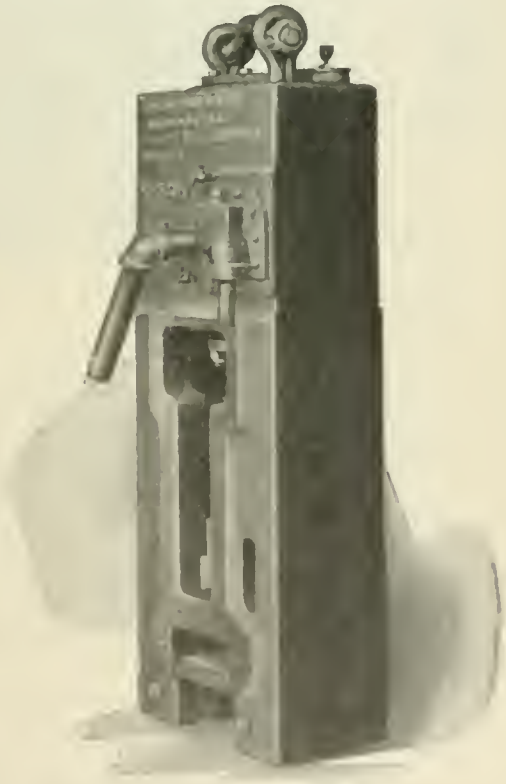

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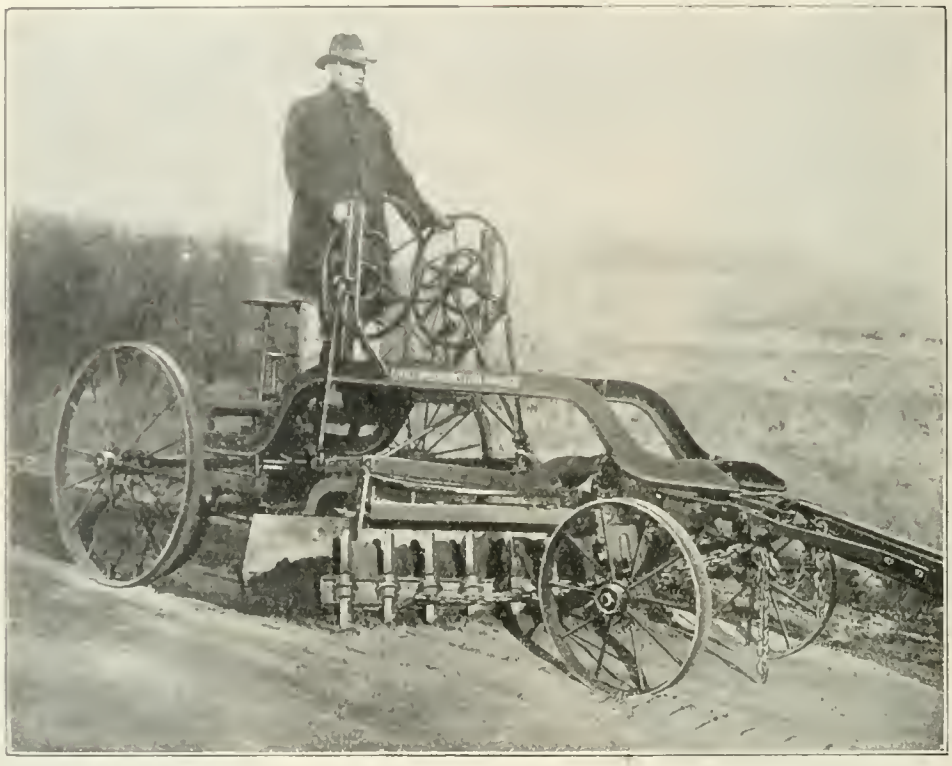

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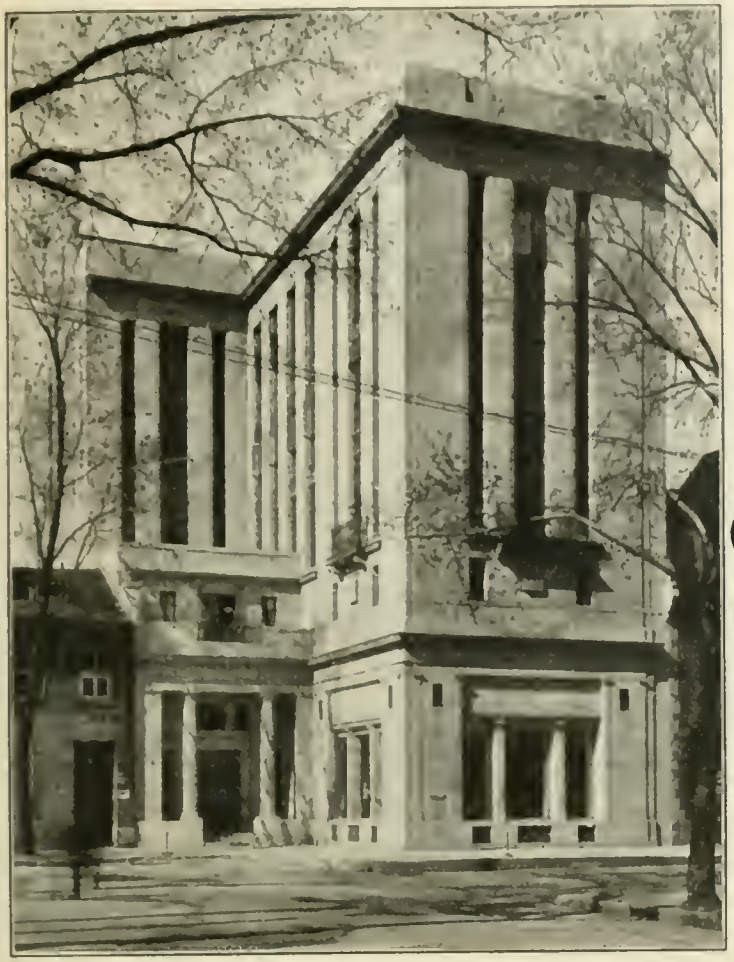

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The weight of the arch has been deducted from safe loads in table below, so that only the dead load of concrete fill, plastering, etc., must be deducted to obtain the net safe live load for any arch and span.

Arches	8 inches	10 inches	12 inches
Spans, Feet and Inches	Pounds	Pounds	Pounds
3-0	735	1084	1487
3-6	531	785	1083
4-0	399	593	820
4-6	309	461	640
5-0	244	367	511
5-6	196	297	416
6-0	159	244	344
6-6	131	203	287
7-0	...	170	243
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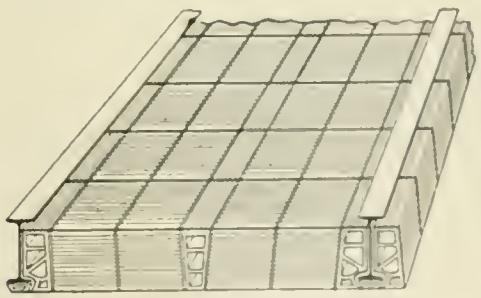
Weight of Arch, Sq. ft.	36	40	46



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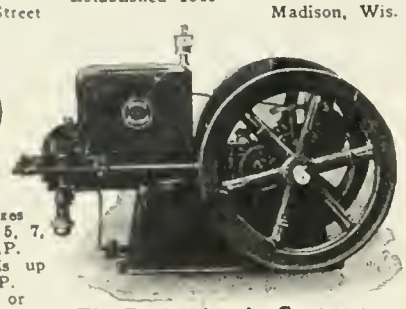
FULLER & JOHNSON
EASY TO START
ENGINES

BUILT FOR SERVICE

"Fuller & Johnson Model N"—that's a name contractors and engineers recognize as applying to a simple, sturdy, dependable, easy-to-start engine—an engine built to fill the particular needs of the construction field.

Let us send you a generously illustrated descriptive catalog, telling all about this Model N Engine

FULLER & JOHNSON MFG. CO.
Established 1840
111 Cedar Street Madison, Wis.



Built in sizes 1¾, 2½, 3, 5, 7, 9, 12, H.P. Other models up to 25 H.P. Stationary or Portable

The Engine for the Contractor

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In Stock

STEAM SHOVELS
Revolving and Railroad Type

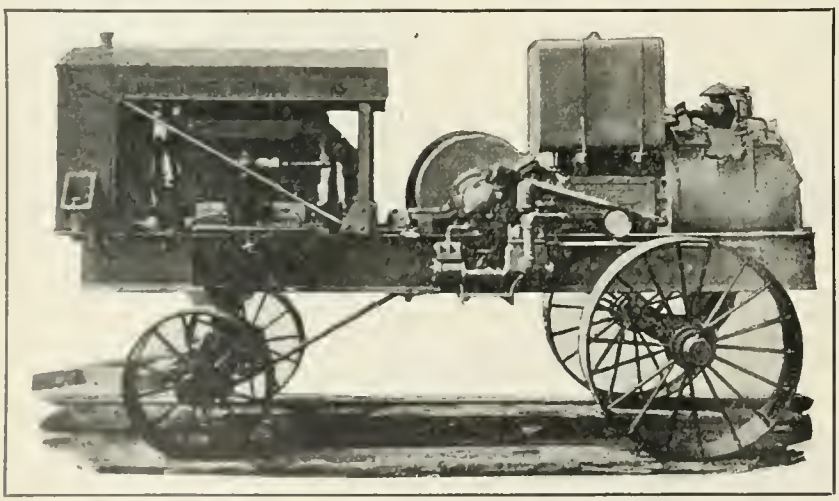
LOCOMOTIVES
Standard, 36″ and 24″ Gauge

CARS
Ballast; 20 yard; 6 yard; 4 yard; 3 yard; and 2 yard

DERRICKS, HOISTING ENGINES
AIR COMPRESSORS, RAILS

Eastern Equipment Co.
Limited
MONTREAL, QUE. DORVAL, QUE.
P. O. Box 792

Municipal Engineers! The City of New York is rebuilding sewers from the inside and avoiding the cost and difficulty of tearing up the streets. So is St. Louis, Mo., Dayton, Ohio, and many others. They are doing it with the equipment illustrated below. Write us for details of this work. We'll show you how to make a better job and also save money.



Taylor 13 in. x 8 in. Portable Gasoline Compressor

N-1—"Cement-Gun"

The "Cement-Gun" is not a restricted article. It may be purchased outright and used by anyone.

Cement-Gun Company Inc.
ALLENTOWN, PA.
New York Chicago Pittsburgh Los Angeles Seattle
Agents in Eastern Canada: General Supply Company of Canada
356 Sparks St., Ottawa. Foreign Agency: International Cement-Gun Co., Ziest, Holland

THE "LEYNER" SHARPENER FILLS CONTRACTORS' NEEDS

August 1, 1923

Gentlemen:

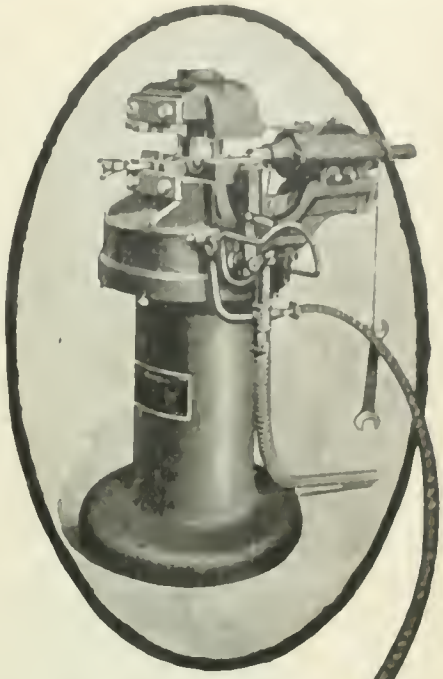
We have at Ely your 8 x 8 Portable Gasoline Compressor, two of your DCR-23 Jackhamers, and a No. 33 Jacksteel Sharpener. The equipment and your service are giving the very highest degree of satisfaction.

Operating with two drill runners, a blacksmith and one part time compressor attendant, we are drilling a footage that would by hand require 90 men, operating as 30 three man hand drill gangs.

These "Imperial" Compressor outfits will reduce prices on rock work all over.

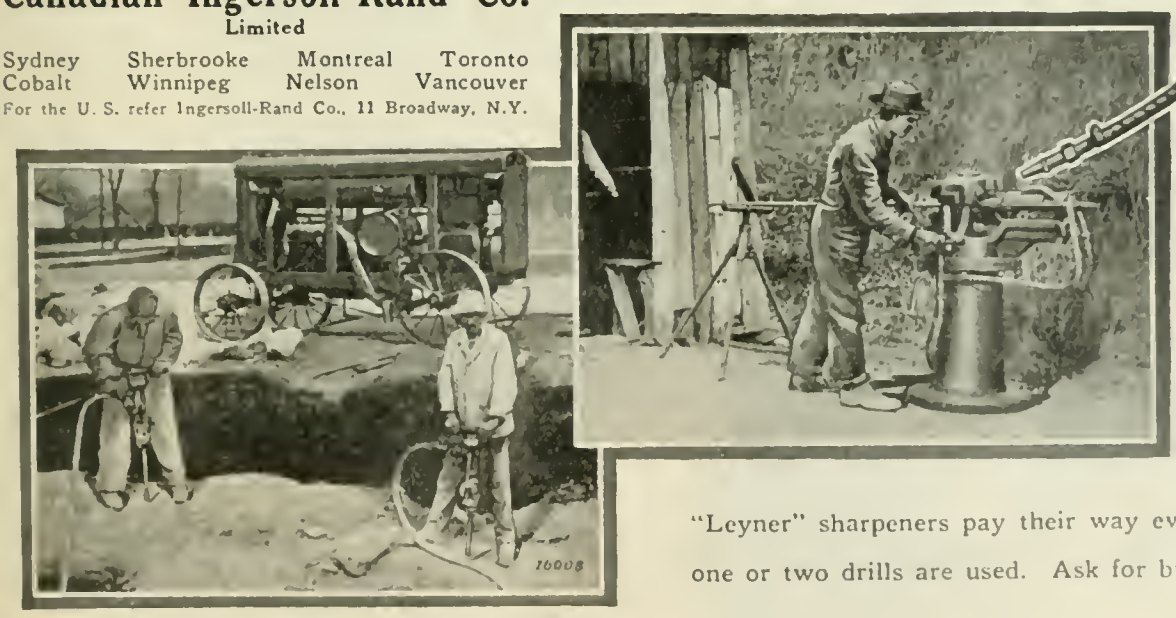
Were I again to start in the contracting business, knowing what I now do, the first equipment I would buy would be an Ingersoll-Rand Portable Gasoline Compressor outfit with drills, and certainly a sharpener.

Yours very truly,
(Name on request)



Canadian Ingersoll-Rand Co.
Limited

Sydney Sherbrooke Montreal Toronto
Cobalt Winnipeg Nelson Vancouver
For the U. S. refer Ingersoll-Rand Co., 11 Broadway, N.Y.



"Leyner" sharpeners pay their way even where only one or two drills are used. Ask for bulletins.

Ingersoll-Rand

"Mr. Dealer, Meet one of your star salesmen ---the Fire Chief!"

The Ontario Gypsum Co. Ltd.,
Paris, Ont.

Kitchener, Ont., Canada, October 14, 1922.

Gentlemen:-

"I received the samples of Gypsum Board and Gyproc sent me by your Company. Please accept my thanks for same. I will do my best to have these materials used in building in our city.

Your fire test of the above products was a real demonstration of the necessity of Fire Proof Buildings in every City, Town and Village in the Dominion of Canada, and I would not hesitate in recommending your products in all classes of buildings."

Yours very truly,
(Sgd.) H. Guerin, Chief, Fire Department.

CANADA'S FIRE CHIEFS do not let their duty to the public end with the putting out of fires. They believe in, and practice, the "ounce of prevention." When they know a device or product that guards life and property, they do not hesitate to recommend its use.

Hence the above letter which is just typical of many we are constantly receiving from fire chiefs throughout the Dominion.

Do you realize, Mr. Building Supply Dealer, what effect the Fire Chiefs are having on the purchases of the home owner, the builder, architect and others? From the flimsy, dangerous lath and plaster of a few years ago, these people, your customers, are changing to the modern, efficient GYROC and other Gypsum products.

Are you getting your share of this business by handling Gypsum Products, or are you forcing them to purchase elsewhere?

THE ONTARIO GYPSUM CO.
Limited
Head Office: PARIS, ONT.

Toronto Offices: 106 Don Esplanade
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The Ritchie Cut Stone Co. Ltd.

Specializes in High-class Work, at Moderate Prices

HERE IS A SAMPLE

The main entrance feature to the W. H. Ballard School, Hamilton, Ont.
P. H. Secord & Sons Construction Co., Ltd.—Contractors Warren & McDonnell—Architects

We carry a large stock of INDIANA LIMESTONE and will be glad to quote on any plan.

After December 15th, 1923, we can make prompt shipments. Our present mill capacity exceeds 1,600 cubic feet per week.

THE RITCHIE CUT STONE CO. LTD., HAMILTON, ONT.

THE CRUSHED STONE LIMITED (FORMERLY OF 47 YONGE STREET ARCADE) WISH TO ANNOUNCE THAT THEY HAVE MOVED TO NEW OFFICES, 216-7 HARLAND SMITH BUILDING, 53 ADELAIDE STREET WEST.

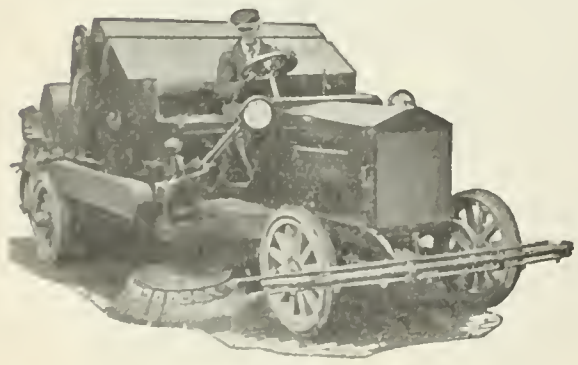
WE THANK YOU FOR PAST BUSINESS AND ASSURE YOU THAT YOUR FURTHER ENQUIRIES AND ORDERS WILL RECEIVE OUR PROMPT AND PERSONAL ATTENTION.

THE CRUSHED STONE LIMITED

53 ADELAIDE STREET WEST TORONTO

NOVEMBER, 1923 TELEPHONE NOS. { ELGIN 1780 / ELGIN 1620

Banish Disease Spreaders from Your City



The dust-raising, germ-spreading, horse-drawn street cleaner is a menace to public health.

The **Austin Pick-up Motor Sweeper** safeguards the health of your city and will show a definite saving in street cleaning expense.

Really valuable information and catalogues will be mailed on request.

Exclusive agents for Canada

The Canadian FAIRBANKS-MORSE CO. Limited

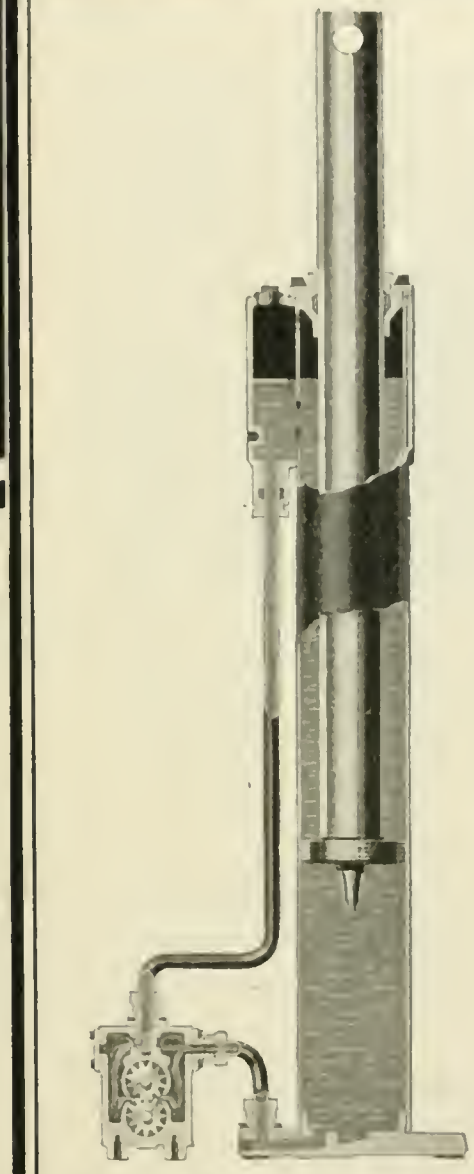
Montreal Toronto St. John Winnipeg Quebec Ottawa
Windsor Vancouver Calgary Regina Victoria

21

WOOD CANADA

Hydraulic Hoists

Efficiency + Simplicity = Dependability



Wood-Canada *Hydraulic* Hoist
Note the simplicity of the hydraulic construction—the absence of bevel gears, chains, sprockets, worm and worm wheels, screw and nuts, thrust bearings, knockout gearing and other mechanism liable to friction and breakdown—no moving parts except a piston and two gears *operating in oil.*

DEPENDABILITY — the most vital quality in a hoist comes most certainly from a combination of high efficiency and simplicity.

EFFICIENCY is lowered only through friction; and there can be *no friction where the power is transmitted by oil.*

SIMPLICITY means fewer vital parts; Wood-Canada *Hydraulic* Hoists have but three moving parts—a piston and two steel gears, all *working in oil.*

WOOD-CANADA *Hydraulic* Hoists—for over a decade and on over a hundred thousand dump trucks—have proven the dependability that comes from efficiency and simplicity.

That is why Wood-Canada Hydraulic Hoists are the first choice of more than 90% of the motor truck makers.

Wood Hydraulic Hoist & Body Co. Ltd.
1025 Tecumseh Road Windsor, Ontario

A Service Exclusively *Otis-Fensom*

Specialists in Vertical Transportation

Branch Offices

Halifax, N.S.
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Seventeen Otis-Fensom service offices, extending across Canada, each assigned a definite district, are available to **every** elevator owner regardless what make of elevator is installed in his premises. The personnel of these seventeen service offices is exclusively Otis-Fensom, trained in our own factories, equipped from every standpoint to handle the simplest or most complex problems common to vertical transportation of all kinds. Any work undertaken by the individual offices entails the support and co-operation of the entire Otis-Fensom organization to a successful fulfillment.

Accessories, supplies and parts are stocked at convenient points ready for immediate shipment, insuring quick delivery.

This is the only service of its kind in the Dominion of Canada.

Full explanation of this service upon request.

OTIS-FENSOM ELEVATOR COMPANY
LIMITED
HEAD OFFICE: 170 BAY STREET
TORONTO

Contract Record and Engineering Review

Devoted to Construction and Engineering

Vol. 37 Toronto, November 28, 1923 No. 48

24,000 Cu. Yds. of Cofferdam Blown Out in Two Shots with 56,000 lbs. of Explosive

Removal of 1100 ft. of Dam Surrounding Site of New River Channel Adds 9½ ft. to the Head of the Great Falls Power Plant on the Winnipeg River

Some very interesting construction work has been carried out in connection with the Great Falls power development of the Manitoba Power Co. on the Winnipeg river. The nature of the scheme was thoroughly explained in the Contract Record of April 26, 1922, page 372, but to briefly review its salient features, it might be explained that the power house proper is located at Island No. 2, (see accompanying map) where the dam will hold the head waters above the power house at Elevation 808, thus forming a pond or peak load reservoir of approximately 2,000 acres in extent, providing a deep, wide and extensive body of water reaching upstream a distance of five miles and flooding out the existing rapids, thus obviating the trouble so often experienced in these northern latitudes from frazil ice, which forms in swift, turbulent water. This dam at Island No. 2 raises the water level by forty-six feet. The reach of the river below the power house was from thirty to ninety feet in depth, this level being maintained by a rock reef across the river at White Mud Falls 2½ miles below the power house. By excavating a channel through this reef, the entire reach of the river between White Mud Falls and the power site was lowered about ten feet, thus making a total operating head of fifty six feet, for which head the turbines are designed.

The construction of this channel was an interesting job, to a description of which the following paragraphs are devoted:

The concluding work in connection with the project was the removal by a charge of explosives of the cofferdams surrounding the site of the channel. The diversion of the entire flow of the river through this channel has increased the operating head on the Great Falls plant by lowering this entire lake level 9½ feet. The channel as excavated is 200 feet wide, 2,200 feet long and varies in depth from 5 to 30 feet below the original rock surface. Approximately 200,000 cubic yards of rock were excavated and used in constructing the main dam at Great Falls.

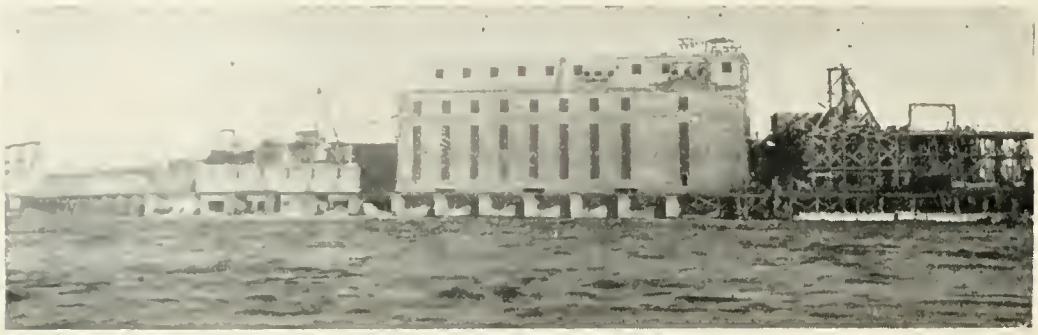
When work was initiated 18 months ago the site of this channel was enclosed by cofferdams composed of timber cribs, filled with rock and sheathed on the outside, and made securely watertight by a clay toe fill. The entire enclosure was then pumped out and the excavation carried on behind this protecting dam.

52,000 Lbs. of Dynamite Exploded

On October 12th the work of excavating and clearing up the channel had been completed and the cofferdams at the upper and lower ends of the channel were undermined and heavily loaded with dynamite, so placed that on firing the charge the entire structure would be completely demolished. At midnight on that date the pumps were shut down and the area

within the enclosure was allowed to fill with water. When sufficient water had entered the enclosed area to thoroughly tamp the explosives the work of dismantling the pumps, removing water pipes, air lines and other construction equipment was undertaken. This work was completed by 2.00 p.m. on October 15th, and all of the men employed on the work, with the exception of those detailed to fire the charge, entrained for Great Falls. Messengers were sent throughout the neighborhood to warn all settlers of the time of the explosion of the charge and whistles were blown continuously until the camp was cleared. When everything was in readiness for the blast a warning shot was fired and five minutes later, at 2.45 p.m., the charge of 14,000 pounds of dynamite was fired, completely removing the down stream cofferdam for a distance of 600 feet, containing a volume of over 4,000 cubic yards of broken stone, heavy timber and clay fill.

Immediately after this shot was fired a complete inspection was made of the wiring for the charge of the upstream cofferdam, and a second warning given to those in the vicinity. At 3.35 p.m. a warning shot was fired and at 3.40 p.m. the switch was closed, exploding 38,000 pounds of dynamite and 4,000 pounds of black powder, completely removing the upstream cofferdam for a distance of 500 feet, containing a volume of 20,000 cubic yards of rock, heavy timber and clay fill, reaching in places a depth of 40 feet.

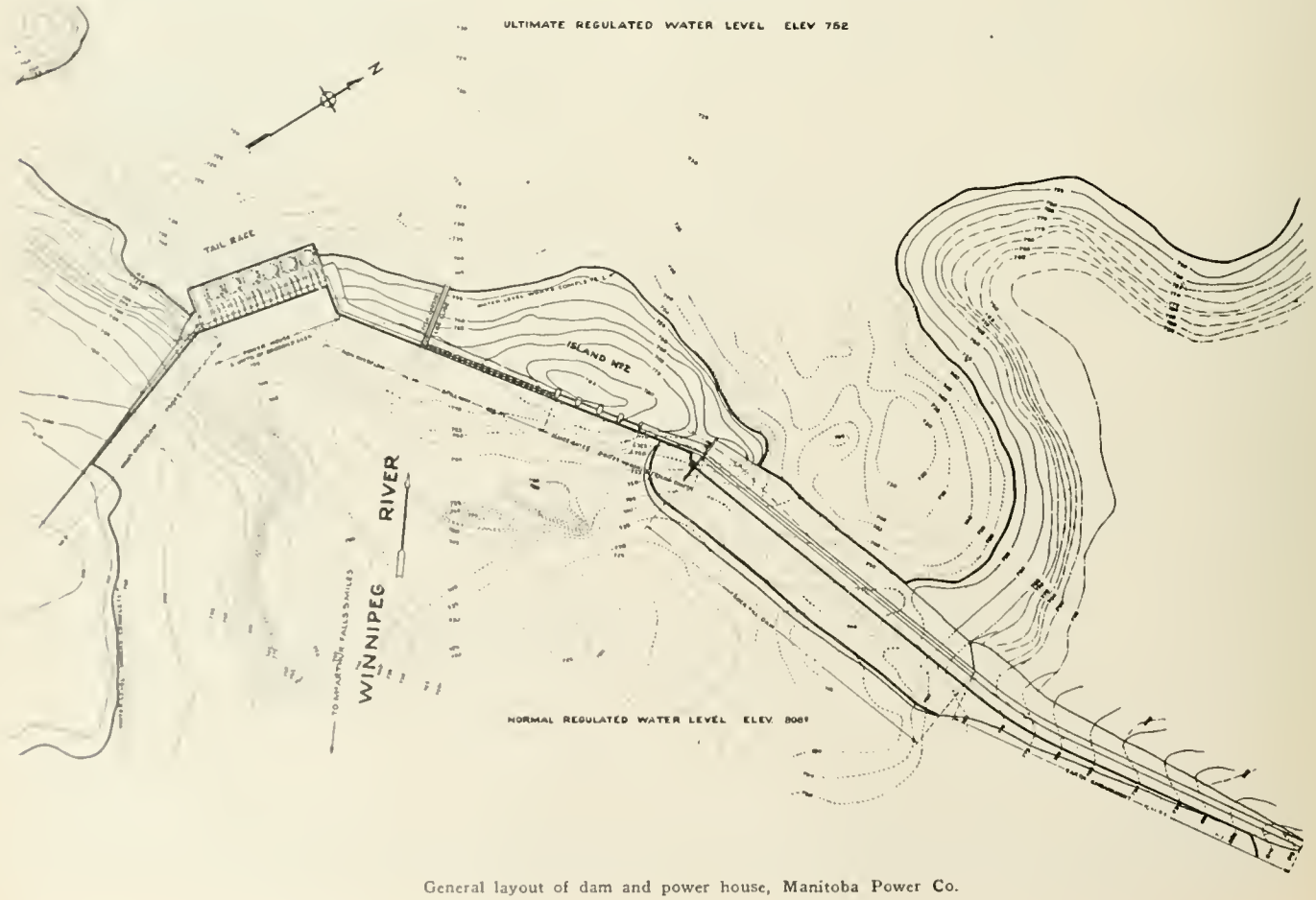


A downstream view of the power house

Permanent Works Nearly Complete

With the firing of the charge under the cofferdam the river was free to flow through the newly formed channel and by 7 o'clock the following morning this entire stretch of river had been changed, the level having been lowered 9½ feet.

With the construction of the White Mud Falls channel the permanent works, comprising the whole scheme of development, was practically brought to completion.



General layout of dam and power house, Manitoba Power Co.

New Railway Viaduct Scheme for Toronto

Canadian Pacific and Canadian National Railways Propose a Modified Plan for Grade Separation—Cost Considerably Lowered and Time of Completion Reduced

At a conference on November 16, between Canadian Pacific and Canadian National Railway officials and the board of control, harbor commissioners and board of trade, of Toronto, Ont., a new scheme for the solution of the city's waterfront railway problem was submitted by the railways. This plan differs somewhat from the one to which all parties agreed in 1913, and which was never consummated owing to the war and the lack of finances since the war.

Under the agreement of 1913 a viaduct across the front of the city was to have commenced a little east of Bathurst street and to have extended to Logan avenue on the east, with bridges at John street and Spadina avenue and subways under the other streets.

Under the new proposal, on which the city representatives refused to commit themselves pending the receipt of detailed plans, the viaduct west of Yonge St. is eliminated and from that street it rises on a one per cent. grade to the east until the level under the old viaduct order is reached at Jarvis street, from which point it will proceed east as originally planned to Logan avenue.

The details as to bridges and subways are as follows: Bathurst street, tracks on level, old bridge; Spadina avenue, tracks on level, old bridge; John street, tracks on level, old bridge; York street, overhead bridge; Bay street, overhead bridge; Yonge street, overhead bridge; Scott street, no provision, street apparently closed; Church street, subway; Jarvis street, subway; George street, no provision, apparently closed; Frederick street, subway; Sherbourne street, no provision, apparently closed; Princess street, subway; Parliament street, subway; Trinity street, subway; Eastern avenue, subway; Queen street, subway; Logan avenue, no provision.

The only modification west of Yonge is a rise of four feet to get into the station to permit the passengers in the station to get under the tracks and also to facilitate drainage.

The total cost under the new plan is estimated at $20,470,000 as compared with $34,000,000 under the old plan, according to M. H. McLeod, consulting officer to the executive of the C. N. R. who outlined the scheme at the conference. The city pays under the new plan, he said, $4,213,683 as compared with $8,846,404. The total saving by the railway companies would be between eight and nine million dollars.

Mr. MacLeod said that the terms as to the width of the bridges and subways were a matter for further negotiation. No provision was made at the streets not designated for bridges or subways on account of their proximity to other streets where protection was provided by means of subways.

Sir Henry Thornton, president of the Canadian National Railways, in introducing the subject made it plain at the outset that the railways were not present to call into question the validity of the viaduct agreement." We reiterate what we said in the signed statement already made public," he said. "We are here to discuss in a kindly and serious fashion a scheme which in my judgment and in the judgment of Mr. Beatty is a more satisfactory solution than any yet proposed. In a scheme of such magnitude it is seldom possible to hit upon a solution in a short time. In the lapse of months points of view change and ultimately you come to a different conclusion than that arrived at originally.

"I should be wanting in good faith and in common sense if I failed to draw attention to something that I think would be better.

"There are some aspects of the plan which are worthy of note. It will involve a saving to the city of about $4,600,000, and between eight and nine millions to the railway companies. How much store you must set upon that statement must rest with the city to decide. You know your resources better than I. So far as the C. N. R. is concerned the question of capital cost must play a large part in our mind. You know our condition. You know that we are struggling to improve our financial position, and if we are successful in lightening the burden to the taxpayer I must scrutinize any matter involving expense, and if there can be evolved a cheaper scheme I must give that great and serious consideration."

Mr. E. W. Beatty, K.C., president of the Canadian Pacific Railway Co., confirmed the stand taken by Sir Henry.

He stated in part:

"The original agreement provided that the portion of the cost to be borne by the city should be based upon the cost of the viaduct to be constructed under the original plans, the total of which was $13,000,000 and if the parties failed to agree as to what this proportion was, that it should be determined by the Board of Railway Commissioners. I mention this fact only for the purpose of indicating that there has been no determination yet of what the city's proportion is, either in percentages or in dollars and cents.

"At the time the agreement was made, the estimated cost of the two companies, including the new Union Station, was between twelve and thirteen million dollars and these costs were submitted to the directors and I think the shareholders of the two corporations when the approval of the agreement by them was obtained.

"I mention the question of costs because it was one of the factors which was before the Railway Board when considering the most desirable form of grade separation on the waterfront. In fact, costs and method of grade separation are inseparable and at the time the scheme was approved the costs bore such a moderate proportion to present-day costs because it undoubtedly influenced the minds of the Commissioners in determining what the proper solution should be. The companies have been severely criticized by the other parties to the agreement because the work has not been carried out, but I am quite frank in saying to you that there has not to my knowledge ever been a time during which it could reasonably be commenced. Works of this magnitude,

in view of the labor and material situation, were obviously impossible during the war and thereafter the position of the Grand Trunk Company was not such as would enable it to place its guarantee on any securities issued for the carrying on of the undertaking. With the acquisition by the government of this system, this disability is removed if parliament votes the necessary authority to the government to guarantee the securities or provides the government's proportion of the requisite funds.

"I have stated that we have been confronted with cost conditions which are, to say the least, abnormal, and I wish to emphasize that position from the standpoint of the general interests of the City of Toronto. We have made the most careful estimate possible of the cost of the whole work, and it approximates, including the station, thirty-six million dollars. That estimate includes certain arbitrary costs such as the value of lands to be taken, and damages. It does not include other items for which no approximation can possibly be made. By that I mean the cost to the railway companies of operating their train and conducting their ordinary traffic while the work is in progress.

"It is obviously impossible for a work of this size to be carried on without serious interruption to the traffic of the companies, and while this cost cannot be measured in dollars and cents, and is not a cost to which any interest contributes except the railway companies themselves, it will, in the opinion of the operating officers of both companies, run into figures of great magnitude.

Means Big Saving

"Therefore, gentlemen, the turn of the wheel has been distinctly to the companies' disadvantage and the effect of the war and after-war conditions has all militated against the companies' position. There is no inexhaustible supply of money for such purposes. In the last analysis, as public carriers, we must obtain our money from the people who will require to pay in traffic the interests on these expenditures. I am not in the fortunate position of my friend, Sir Henry Thornton. I have no powerful government backed by the credit of the whole nation to endorse my securities or pay my interest charges. In the case of the Canadian Pacific the obligations are direct and the amounts must be earned and ordinary charges paid or else the credit of the company is irreparably damaged, and I might as well frankly admit that I do not contemplate with any equanimity an enormous burden of this kind added to the already heavy obligations of the company."

Mr. MacLeod then explained the details of the scheme and answered questions. During the discussion it was intimated that the new proposal could be built in 10 months.

Gypsum Board for Electrical Installations

The Hydro-electric Power Commission of Ontario have approved of the use of Gyproc plaster board, 3/8 in. thick, for use in lining wooden cabinets and meterboards: This approval and recommendation is based upon the results of fire tests conducted at their laboratories, and places gypsum wall board upon a parity with asbestos board for fire protection of wooden cabinets and meterboards used in electrical installations. The recommendation has been approved by Mr. W. P. Dobson, laboratory engineer, Mr. W. C. Cale, assistant laboratory engineer, Mr. A. S. L. Barnes, secretary of the approvals committee and Mr. F. A. Gaby, chief engineer, all of the Hydro-Electric Power Commission of Ontario. This is another illustration of the high fire resisting properties of gypsum wall board.

No. 108

Canada's Engineers — D. W. Mill

Mr. David William Mill, who was some time ago appointed superintendent of surveys in the Department of Lands and Forests of the Province of Quebec, was born in 1879 in Maria Bonaventure County, P. Q.. He received his primary education at the College of Levis, P. Q., and subsequently under private tuition and at Laval University. In 1900 he successfully passed his examinations for the practice of land surveying in the Province of Quebec.

During the next ten years, from 1900 to 1910, Mr. Mill was engaged in the practice of all branches of his profession both on his own account and for the government. In 1910 he accepted the position of assistant to the surveyor-general and chief inspector of surveys for the Department of Lands and Forests, which position he held until a year or so ago when he was appointed superintendent of surveys for the same department.

Mr. Mill is a Colonial Fellow of the Surveyors' Institution of Great Britain; a member of the Professional Association of Engineers of Quebec, and an associate member of the Engineering Institute of Canada. He is also vice-president and examiner of the board of management of the Land Surveyors' Corporation of Quebec.

Mr. David Wm. Mill

Of Vital Interest to the Contractor

Standardized Sizes and Grades for Lumber

It is Anticipated that The Recommendations of a Strong Committee that Has Been Studying Lumber Production and Use Will be Accepted by the Industry

Contractors, house builders, engineers and architects, representing large consumers of lumber, will appreciate the efforts that are being made in the United States to standardize lumber sizes and grades. This movement is of as much interest to Canadian as to American lumber users, inasmuch as United States standards are accepted and adopted in this country and are virtually continental in their application.

Stimulated by the U. S. Department of Commerce, under Hon. Herbert Hoover, the lumber industry has been making a concerted effort to establish itself on a sounder, more economical, and less wasteful basis than formerly. In connection with this effort the standardization of sizes and grades and the development of methods of securing their observances are fundamentally important. To consider these problems of lumber standards and to formulate such specific recommendations as in its judgment are most practical, may be expected to be most effective in practice, and will best promote the objectives sought, a Central Committee on Lumber Standard was created as a result of conferences of representatives of the various manufacturing, marketing, and consuming interests.

With the aid and upon the advice of its Consulting Committee, including representatives of producers, distributors, and consumers, the Central Committee has formulated specific recommendations covering standard lumber classification, standard grade names and classifications, standard yard lumber sizes, method of lumber measurement, standard shipping weights and shipping and other provisions.

These recommendations have been submitted to Mr. Hoover who has arranged a conference on December 12 at which it is expected that the findings of the Central Committee will be ratified and given official status. While many of the proposals are of interest mainly to lumber producers and dealers, some have a bearing on the work of the contractor and engineer. For that reason they are brought to their attention in the following article.

The first recommendation has to do with lumber classification and this is arranged according to use, size and manufactured condition: According to use lumber is classified as (a) **Yard Lumber**, (b) **Structural Timbers**, and (c) **Shop** or **Factory** lumber. Different grading rules may apply to each class of lumber.

(a) **Yard Lumber**: Lumber that is less than six inches in thickness and is intended for general building purposes. The grading of yard lumber is based upon the use of the entire piece.

(b) **Structural Timbers**: Lumber that is six inches or over in thickness and width. The grading of structural timbers is based upon the strength of the piece and the use of the entire piece.

(c) **Shop** or **Factory Lumber**: Lumber intended to be cut up for use in further manufacture. It is graded on the basis of the percentage of the area which will produce a limited number of cuttings of a given minimum size and quality.

The classification according to size is as follows:

Yard Lumber

(a) **Strips**: Yard lumber less than two inches thick and under eight inches wide.

(b) **Boards**: Yard lumber less than two inches thick, eight inches or over in width.

(c) **Dimension**: All yard lumber except boards, strips, and timbers; that is, yard lumber two inches and under six inches thick, and of any width.

(1) **Planks**: Yard lumber two inches and under four inches thick and eight inches and over wide.

(2) **Scantlings**: Yard lumber two inches and under six inches thick, and under eight inches wide.

Structural Timbers

(3) **Heavy Joists**: Yard lumber four inches and under six inches thick, and eight inches or over wide.

(d) **Timbers**: Lumber six inches or larger in least dimension.

Manufacturing Classification

Manufactured lumber is classified as (a) rough, (b) surfaced, and (c) worked.

(a) **Rough** lumber: Undressed as it comes from the saw.

(b) **Surfaced** lumber: Lumber that is dressed by running through a planer. It may be surfaced on one side (S1S), two sides (S2S), one edge (S1E), two edges (S2E) or a combination of sides and edges (S1S1E), (S2S2E) or (S4S2E) or (S4S).

(c) **Worked** lumber: Lumber which has been run through a matching machine, sticker or moulder. Worked lumber may be (1) matched, (2) shiplapped, or (3) patterned.

(1) **Matched** lumber: Lumber that is edge dressed and shaped to make a close tongue and groove joint at the edges or ends when laid edge to edge or end to end.

(2) **Shiplapped** lumber: Lumber that is edge dressed to make a close rabbetted or lap joint.

(3) **Patterned** lumber: Worked lumber that is shaped to a pattern or moulded form.

Standard Grade Names and Classifications

With regard to standard grade names the committee recommends that, to the extent to which differences in quality of timber, in conditions of manufacture and in uses to which the product is put will, in practical application, permit, the basic provisions for the grading of lumber should be uniform. The [illegible] grade classification for yard lumber is shown in the accompanying table. The term "yard lumber" as here used means lumber that is manufactured and classified into those sizes, shapes, and qualities required for ordinary construction and general purposes. [illegible] Heavy timbers for structural purposes, standard factory lumber, hardwood factory lumber and other special-use materials are not considered yard stock.

On the basis of quality, yard lumber is divided into two main divisions (a) select lumber and (b) common lumber. These are again divided into two classes—select lumber (1) that suitable for natural finishes and (2) that suitable for paint finishes; common lumber into (1) that which can be used without waste (2) that which permits some waste. Each of these four classes is further divided into quality classes or grades.

Dimension lumber is graded as No. 1 common, No. 2 common and No. 3 common.

Standard Yard Lumber Sizes

The following recommendations apply to sizes:

That the terms standard board and standard dimension be adopted as designations for 1 inch boards (yard) and 2 inch dimension (yard) respectively and applied to both softwoods and hardwoods.

That 25/32 inch, S1S or S2S (measured at standard commercially dry shipping weight and moisture content for each species) be adopted as the minimum thickness for the standard yard board.

That 1-5/8 inches, S1S or S2S (measured at standard commercially dry shipping weight and moisture content for each species) be adopted as the minimum thickness for standard dimension not more than 12 inches wide.

That the finished widths of boards, dimensions and finished S1E or S2E (measured at standard commercially dry shipping weight and moisture content for each species) be 3/8 in. off, on lumber of standard widths less than 8 in.; and 1/2 in. off, on lumber of standard widths of 8 in. and over.

That the standard minimum thicknesses and standard widths of finished lumber be as follows:

Summary of Standard Sizes for Yard Lumber

S1S or S2S; S1E or S2E

1. Finish, common boards and dimensions.

Note: The thicknesses apply to all widths and the widths to all thicknesses

Product	Size, Board Measure Thickness	Width	Dressed dimensions at standard commercially dry shipping weight and moisture content Thickness (Minimum)	Width
	Inches	Inches	Inches	Inches
		3	5/16	2 5/8
		4	7/16	3 5/8
		5	9/16	4 5/8
		6	11/16	5 5/8
Finish	1	7	25/32	6 5/8
	1 1/4	8	1 1/16	7 1/2
	1 1/2	9	1 5/16	8 1/2
	1 3/4	10	1 7/16	9 1/2
	2	11	1 5/8	10 1/2
	2 1/2	12	2 1/8	11 1/2
	3		2 5/8	
	1	3	25/32	2 5/8
	1 1/4	4	1 1/16	3 5/8
	1 1/2	5	1 5/16	4 5/8
Common Boards	2	6	1 5/8	5 5/8
		7		6 5/8
		8		7 1/2
		9		8 1/2
		10		9 1/2
		11		10 1/2
		12		11 1/2
	2	2	1 5/8	1 5/8
	2 1/2	4	2 1/8	3 5/8
Dimension	3	6	2 5/8	5 5/8
	4	10	3 5/8	7 1/2
	Over 4	10	3/8 Off	9 1/2
		12		11 1/2

2. Siding, Flooring, Ceiling, Partition, Shiplap and Dressed and Matched

Note: The thicknesses apply to all widths and the widths to all thicknesses

Product	Size, Board Measure Thickness	Width	Dressed dimensions at standard commercially dry shipping weight and moisture content Thickness (Minimum)	Face Width
	Inches	Inches	Inches	Inches
Bevel Siding		4	1/2 by 3/16	3 1/2
		5	5/8 by 3/16	4 1/2
		6		5 1/2
	Minimum		D & M	Shiplapped
Rustic and Drop siding	9/16	4	3 1/4	3 1/8
	3/4	5	4 1/4	4 1/8
		6	5 1/4	5 1/8
		8	7 1/4	7 1/8
		10	9 1/4	9 1/8
Flooring		2	5/16	1 1/2
		3	7/16	2 3/8
		4	9/16	3 1/4
	1	5	25/32	4 1/4
	1 1/4	6	1 1/16	5 1/4
	1 1/2		1 5/16	
Ceiling		3	5/16	2 3/8
		4	7/16	3 1/4
		5	9/16	4 1/4
		6	11/16	5 1/4
Partition			3/4	2 3/8
				3 1/4
				4 1/4
				5 1/4
Shiplap	1	4	25/32	3 1/8
		6		5 1/8
		8		7 1/8
		10		9 1/8
		12		11 1/8
Dressed and Matched	1	4	25/32	3 1/4
	1 1/4	6	1 1/16	5 1/4
	1 1/2	8	1 5/16	7 1/4
	2	10	1 5/8	9 1/4
		12		11 1/4

(1) The over-all widths of patterned material may be computed on the following basis: Based on material 1-inch thick, the tongue shall be 1/4 inch wide in tongued and grooved lumber, and the lap 3/8 inch in shiplapped lumber; or, based on material 2 inches thick, the tongue shall be 3/8 inch in tongued and grooved lumber, and the lap 1/2 inch in shiplapped lumber, with face 1/8 inch narrower in 2-inch lumber than in 1-inch lumber.

3. Factory Flooring, Heavy Roofing, Decking and Sheet Piling

Note: The thicknesses apply to all widths and the widths to all thicknesses

Size, Board Measure			Dressed dimensions at standard commercially dry shipping weight and moisture content		
			Face Width		
Thickness	Width	Thickness (Minimum)	D & M	Shiplapped	Grooved for Splines
Inches	Inches	Inches	Inches	Inches	Inches
2	4	1 5/8	3 1/8	3	3 1/2
2 1/2	6	2 1/8	5 1/8	5	5 1/2
3	8	2 5/8	7 1/8	7	7 1/2
4	10	3 5/8	9 1/8	9	9 1/2
	12		11 1/8	11	11 1/2

That lengths in multiples of 1 foot be considered standard; that lengths not in multiples of 1 foot be considered special.

The following thicknesses and widths shall be considered standard. All other sizes shall be considered special.

Thicknesses: 5/16", 7/16", 9/16", 11/16", 1", 1 1/4", 1 1/2", 1 3/4", 2", 2 1/2", 3", 3 1/2", 4 inches and up in multiples of 1 inch for rustic, drop siding and partition. 3/4 inch, and for bevel siding, 1/2" by 3/16" and 5/8" by 3/16".

Widths: 1 inch and up, board measure, in multiples of 1 inch.

Summary of Basic Grade Classifications for Yard Lumber

Total products of a typical log arranged in series according to quality as determined by appearance.

- **Select** — Lumber of good appearance and finishing qualities.
  - Suitable for natural finishes.
    - Grade A—Practically free from defects.
    - Grade B—Allows a few small defects or blemishes.
  - Suitable for paint finishes.
    - Grade C—Allows a limited number of small defects or blemishes that can be covered with paint.
    - Grade D—Allows any number of defects or blemishes which do not detract from a finished appearance, especially when painted.
- **Common** — Lumber containing defects or blemishes which detract from a finish appearance but which is suitable for general utility and construction purposes.
  - Lumber suitable for use without waste.
    - No. 1 Common—Sound and tight knotted stock. Size of defects and blemishes limited. May be considered water tight lumber.
    - No. 2 Common—Allows large and coarse defects. May be considered grain-tight lumber.
  - Lumber permitting waste.
    - No. 3 Common—Allows larger and coarser defects than No. 2 and occasional knot holes.
    - No. 4 Common—Low quality lumber admitting the coarsest defects such as rot and holes.
    - No. 5 Common—Must hold together under ordinary handling.

Methods of Lumber Measurement

Lumber of standard size shall be tallied board measure. On lumber of standard thickness less than 1 inch (board measure), the board foot measurement shall be based on the surface dimensions.

All dressed stock of standard size shall be measured and sold on the basis of the corresponding dimensions of rough green lumber; provided, that the measurement and description of thickness of such stock less than 1 inch thick, board measure, shall be its actual thickness in standard commercially dry condition. The finished dimensions of all dressed stock of standard size shall not be less than the standard minimum dimensions herein provided; and the finished dimensions shall be shown on the invoice.

The average length of a shipment of lumber 1 inch or less in thickness shall be computed by dividing the total length in feet by the total number of pieces in a shipment.

The measurement of thickness of lumber shall be as follows:

Measurement of Boards, Dimension, Finish, Flooring, Siding, Ceiling, Partition and Other Items of Dressed Lumber

Lumber measured as	Board Measure Inches	Minimum Thickness S1S or S2S; at standard commercially dry shipping weight and moisture content Inches
" " "	1" to be not less than	25/32"
" " "	1 1/4" " " "	1 1/32"
" " "	1 1/2" " " "	1 9/32"
" " "	1 3/4" " " "	1 7/16"
" " "	2" " " "	1 5/8"
" " "	2 1/2" " " "	2 1/8"
" " "	3" " " "	2 5/8"
" " "	3 1/2" " " "	3 1/8"
" " "	4" " " "	3 5/8"

The measure and description of thickness of dressed stock less than 1 inch, board measure S1S or S2S, shall be its actual thickness at standard commercially dry shipping weight and moisture content.

(Note: It is to be understood that the thickness of rough lumber commercially dry, is in excess of the thickness of finished lumber of the corresponding size, board measure, by the amount necessary to permit of surfacing either one side or two sides).

Shipping Provisions

In shipments of rough boards and finish, pieces 1/2 inch or more above the count thickness, such as may be produced by uneven sawing, may, at the option of the buyer, be rejected or accepted as of the next lower grade.

Unedged lumber shall be measured across the average width of the board on the narrow face in 1 inch 1 1/4 inch, and 1 1/2 inch lumber. The width of 2-inch and thicker material shall be 1/2 of the sum of the average widths of the narrow and wide faces.

Small dimension stock shall be tallied by the board feet contents.

Material shipped on stock sizes shall be tallied by the number of pieces of each size and length in the shipment.

In shipments measured on board measure, a piece tally in board feet shall be made.

That the actual thickness and width of lumber shipped when not of standard size be indicated on invoice.

That in order to encourage the maintenance of standard sizes as agreed to, lumber manufactured and sold as standard, if grade-marked be marked by an appropriate brand or insignia to indicate that it is of standard size.

Larger Canadian Offices for Dake Engine Co.

The Canadian office of the Dake Engine Co., of Grand Haven, Mich., has been moved from 45 Adelaide St. E. to 502 Kent Bldg., Toronto. This change has been made on account of the increase in Canadian business since the company opened their Canadian branch office two years ago. The new quarters, being larger, will give increased facilities for handling customers' requirements.

Pawling and Harnischfeger Appointment

The Pawling & Harnischfeger Company of Milwaukee, Wisconsin, manufacturers of excavators, cranes and machine tools, have recently appointed Mr. R. P. McCormick as their Eastern sales manager with headquarters at 50 Church Street, New York City, and 605 Stephen Girard Bldg., Philadelphia.

Ottawa is Building Two Bath Houses

Following the Lead of Several Other Cities, the Capital is Installing Public Batheing Facilities—Description of the Champagne Bath in the East End of the City

A number of Canadian cities are now operating public baths, and this number is increasing as the public recognizes their usefulness. The city of Ottawa, Ont., will soon be classed among those to possess such a necessary improvement, as before long two modern public baths will be in operation there.

The following is a description of the east end bath. The other, which is located at the west end of the city, is of a somewhat different design from the one now to be described.

The east end or the Champagne bath is a struc-

Exterior view of Ottawa's new bath house

ture built of stone, concrete, brick and metal throughout, including floors, doors and sashes. It is divided into two departments, one containing the administration offices, the dressing rooms, shower baths, toilet rooms, etc., and the other exclusively used for the swimming pool, the former measuring 50 ft. x 45 ft., and the latter 92 ft. x 45 ft. The total height from the deepest point in the pool to the highest point of the roof is 38 ft.

The foundation walls of the building measure 18 inches in thickness, and rest on concrete footings. The outer walls are constructed of local brick and interlocking tile plastered on the inside. The front wall is considerably ornamented with carved Indiana limestone which presents a pleasing appearance. The steel roof is covered with galvanized iron tile.

The Swimming Pool

The dimensions of the swimming pool are 75 ft. x 30 ft.; its walls are made of waterproof reinforced concrete and lined with ceramic mosaic tile. The floor of the pool is on an incline as is clearly shown in one of the accompanying illustrations. Steel ladders and diving platforms are provided opposite and above the deepest point in the pool which is about 9 feet. A six-foot tile platform is built around the pool, the floor of which is a few inches above the water line of the bath. There is also an elevated gallery located ten feet above the floor and extending entirely around the pool. It is provided with an iron hand railing and is supported on steel columns.

There is a gutter formed in the walls of the pool, the bottom of which is semi-circular in section. Drains or overflows are provided at different intervals along the walls of the pool, and there is also a number of vacuum outlets arranged along the walls of the bath section for removing any sediment which may sink to the bottom.

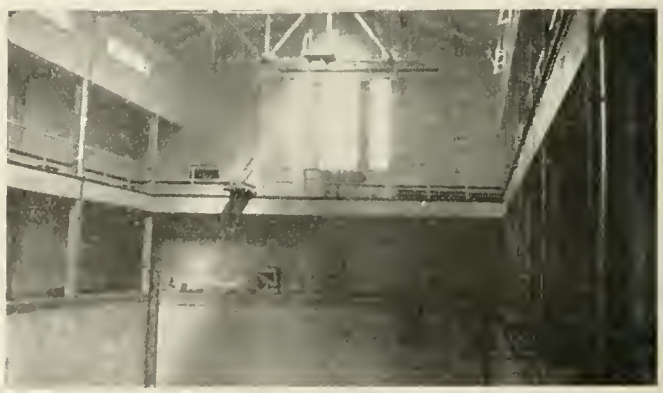
The water for the swimming pool is heated by special heaters and kept automatically at a fixed temperature. The design is so arranged that the water which flows into the pool at a constant rate is continuously withdrawn, filtered and returned to the bath. The arrangement of the regulation of the flow is such that the water can be entirely renewed in from 24 to 48 hours, the time depending on the number of bathers; but the pool can be completely emptied in five hours if it should be so desired.

The entire exposed surfaces of the pool section are enameled white, presenting a neat and inviting appearance. There is a complete elimination of corners and coves, which keeps to a minimum any accumulation of dirt and dust. The pool is top lighted by means of numerous skylights, an ideal light for swimming purposes.

The arrangement of the passages from the dressing rooms to the swimming pool is such that the bathers must pass from the locker rooms through a shower bath before entering the pool, and the public wishing to go up in the gallery are sent direct there from the public hall, as access to the floor surrounding the pool may only be had by the bathers.

Administration Section

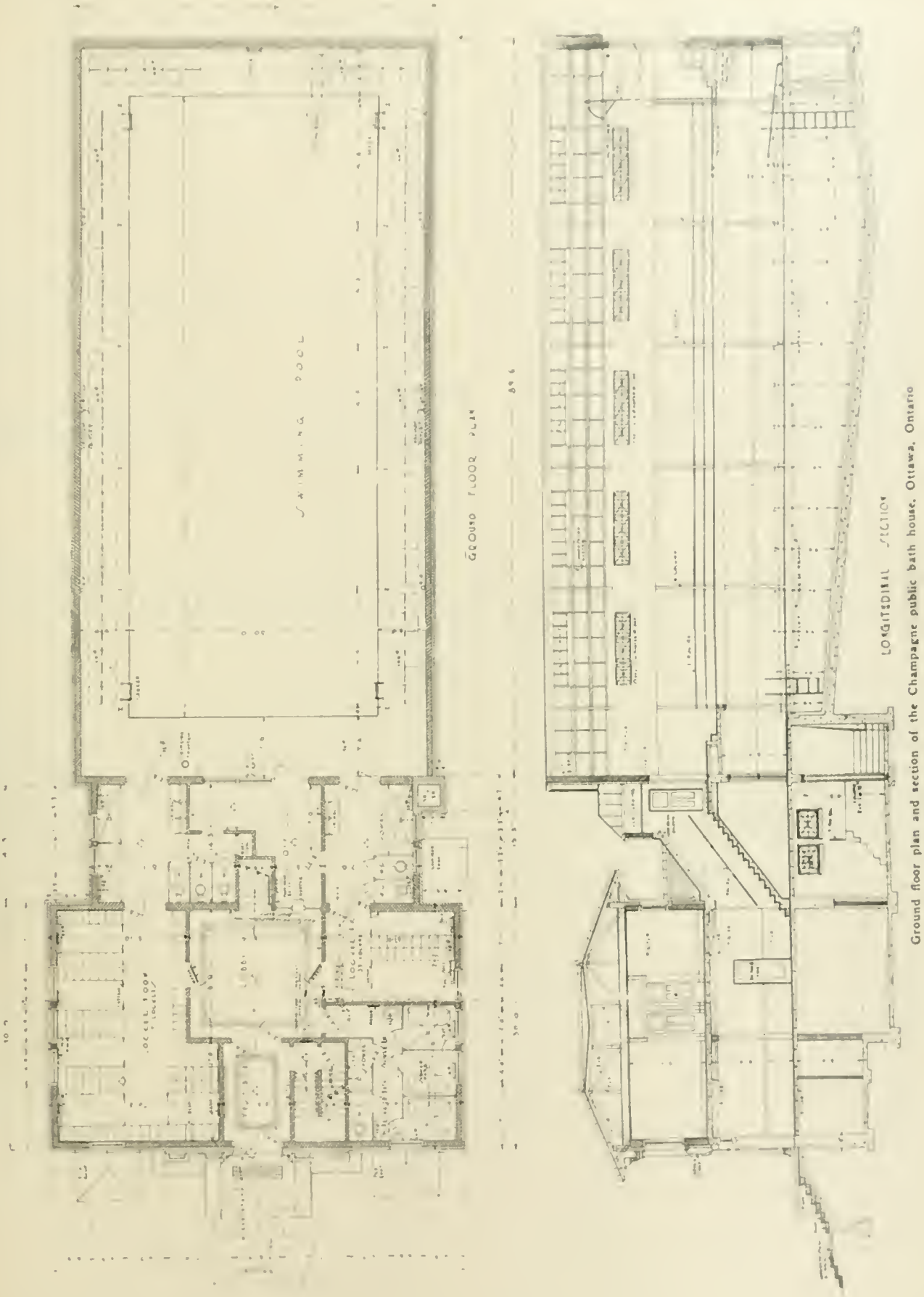
The administration section of the building is also modern in every respect. It contains on the ground



A view of the swimming pool

floor, a 16 feet square lobby, an office, public shower and locker rooms, toilet and a private bath and shower room. On the upper floor is the janitor's residence comprising a hall, living and dining rooms, kitchen, two bedrooms and a bath room. The basement, access to which may be had by an outside entrance, contains public lavatories for men and women. It also contains storage rooms, coal bins, the boiler room and the mechanical equipment for the swimming pool.

The steps and doorways to the entrances, which



Ground floor plan and section of the Champagne public bath house, Ottawa, Ontario

are closed by steel doors, are made of cut stone and concrete. The main entrance leads to the lobby through an 8 ft. x 12 ft. vestibule, and around the former are distributed the other departments of that section of the building.

On the main floor there are two locker rooms, one containing 117 lockers and the other, 35; these are arranged in rows back-to back, and spaced 3½ ft. apart. There is a mirror and a glass shelf at the inner end of each aisle which is closed off, by duck curtains. There are two shower bath rooms, one containing five shower equipments, and the other three. The floors of the shower bath rooms are made slightly sloping toward drain openings covered with strainers. There are five toilet rooms on this floor in connection with the shower baths. There is at the front end of the building a private bath and shower room, which contains three tub baths, a shower, toilet and dressing space.

The office is located so that the supervisor can see over both the main entrance and the swimming pool. The door to the private bath room and the doors of the locker rooms are electrically controlled from the office.

All floors of the administration end of the building are finished with terrazzo, and all interior walls and partitions are finished with marble.

There are two reinforced concrete stairways leading from the ground floor, one to the janitor's residence, and one to the balcony above the swimming pool.

The building is heated by steam.

The cost of the structure will be about $80,000, it is expected.

Messrs. Noffke, Morin & Sylvester, of Ottawa, Ont., are the architects who designed and supervised the construction of the Champagne bath just described. Mr. W. Monette, of Ottawa, is the general contractor.

Saskatchewan's Highway Progress

A Review of the Year's Work

Over One Million Dollars Will Have Been Spent on Provincial Highways During 1923, as Well as $380,000 on Market Roads—Maintenance Department is a New Feature of Saskatchewan's Organization

By H. S. CARPENTER
Deputy Minister of Highways of Saskatchewan

The department of highways for the province of Saskatchewan administers the money voted by the legislative assembly for the construction and maintenance of roads on the provincial highway system and the main market roads; bridges; dams and reservoirs (for the securing of a water supply for cattle and threshing purposes in these districts where the natural supply is limited or difficult to obtain); the operation and the maintenance of public ferries and the making of road surveys in connection with any of the above works, also drainage works.

The Roads of the Province

The roads of the province are practically all earth roads with earth surfaces. Very little gravel surfacing has yet been done, owing to the scarcity of gravel deposits and the necessity of first building up the earth roads to form a satisfactory and consolidated base for the deposition of a gravel surface, and the establishment of a proper system of connected drainage to these roads. There are no macadam, asphalt or concrete roads outside of the boundaries of the cities.

In the settled area of the province there are some 210,000 miles of surveyed road allowances in a more or less improved condition. The main market road system absorbs 32,000 miles of this amount. The main market roads are those roads on which traffic is concentrated and which communicate in a definite direction from the farming settlements to the market centres having railway depots. Again, of this 32,000 miles, about 7,300 miles of road has been selected and classified to form the Saskatchewan provincial highway system. The roads so selected are inter-urban and inter-communicating roads, from one market centre to another and it is on this system that the work of road construction under the "Canada Highways Act" is undertaken, with the federal government contributing 40% of the cost and the Saskatchewan government contributing 60% from provincial funds. The rural municipalities have not been called upon to contribute any money from their local funds towards the building of the sections of highways selected for construction with federal aid.

Provincial Highways

During 1923 the construction was continued of those sections of the provincial highway system for which agreements have been entered into with the federal government and it is anticipated that by the end of the season a total of 1,075 miles of the system will have been completed. The work this season consists of completing the unfinished mileage profiled and laid out during 1922, and the construction of at least 315 miles profiled for the season of 1923. It is expected that the expenditure of these highways for the full fiscal year will be $1,060,000. Nearly the whole of the work is undertaken under contracts let by public tender to the lowest bidder, but on a half dozen sections, owing to conditions not being favorable to the letting of the work by contract, the work has been placed in the hands of road foremen with gangs organized by the department on a day labor basis. Of the above cost the Federal government

will contribute 40% and the Saskatchewan government, 60% from the provincial funds. The rural municipalities will not contribute from their own funds towards the cost of the construction of these highways. The total expenditure on provincial highways to April 30th, 1923 on 700 miles of roads was $2,008,000.00 and the subsidy received from the federal government on this expenditure was $747,519.00.

Main Market Roads

For the construction and improvement of this class of roads the department uses:—(a) the road organizations of the municipalities, and (b) its own labor force employed during the season directly under foremen appointed by the department on a day labor basis.

In handling road construction work and using the municipal organizations, specific contracts for a given amount covering the work to be done, are entered into between the minister of highways and the rural municipalities in accordance with specifications framed by the department and approved by the minister. On completion of the work, the municipality reports and presents a request for payment. The work done is then inspected by an official of the department and is paid for on a certification from the inspector that full value has been received for the money provided. The work undertaken by the road foreman is also subject to close inspection.

The work authorized from year to year on the main market road system is not continuous in mileage, the policy of the department being that the most urgent and important sections of the main market road system that require attention are selected each year, so that the improvement of this system is a matter of annual progression. This work takes the form of assistance to the rural municipalities in their road construction and the end in view is to systematically eliminate or lessen the obstacles to travel on individual sections of the main market system from year to year and to build up on this system a reliable and uniform standard of earth not quite equal to and not as expensive as the provincial highway system.

It is anticipated that expenditure on this class of roads for this season will not be less than $380,000.00. It may be said that the whole of the 25,000 miles forming the main market road system is in a more or less improved condition and can be travelled at all seasons of the year without difficulty, except at some weak links during periods of excessively rainy weather.

Construction of Bridges

For concrete and steel bridges built for capital account the government will spend not less than $120,000.00 and upon timber bridges, new structures and those replacing decayed ones, more than $150,000.00. Concrete and steel bridges are being constructed under contracts let by public tender; the contracts go to the lowest tenderer. The timber bridge work is handled by regular gangs organized by the department; they work on a day labor basis during the season.

Maintenance of Provincial Highway.

This spring a distinct branch of the department was organized to establish a systematic and permanent system of maintenance of provincial highways in accordance with the agreement entered into between the provincial and the federal governments. The road drag competition formerly held annually by the government had been discontinued by [illegible] legislative assembly in their session of 1923-24 had amended section 8 of the Highways Act, granting grants to rural municipalities for maintenance of roads, so that no provision is now made for the payment of a maintenance grant is each to the rural municipalities. The department has therefore used the money devoted formerly to the above purpose as a fund from which to operate their maintenance organization on those sections of the provincial highways which have been completed and taken off the hands of the contractors. The rural municipalities have not been required to contribute any money from their local funds towards the maintenance of these completed sections of the provincial highways.

Early in the spring, this branch of the department outlined an adequate patrol system, dividing the completed roads into sections, appointing patrolmen on these sections and supervisors over divisions embracing several of these sections and supplying the patrolmen with the necessary road drags and tools to completely patrol and maintain 900 miles of completed highway. In addition to this mileage, this branch have extended their work to cover 220 miles of road abutting on the completed highways in order to keep in repair certain connecting roads that form links of the highway system. These sections, of course, are not up to the uniform high standard of the provincial highways but are sufficiently improved to warrant immediate maintenance by the branch.

On account of inadequate drainage and low grades, the exceptionally wet season made the problem of keeping up this class of road difficult and any acute interruption to traffic on roads maintained by the department occurred on these sections. The season proved to be an unusually wet one, with spasmodic heavy rainfalls and the water lay in the ditches for long periods, but it is pleasurable to note that under such trying conditions no serious interruption of the general traffic has been reported on these sections of the highway under direct control of the maintenance branch of the Department. It is expected that the department will expend not less than $80,000.00 on this maintenance work for the full season.

In addition to the above expenditures will be made on the following activities:—

Public ferries at 45 crossings, carrying over 600,000 units of traffic for the season	$115,000.00
Fireguards	500.00
Water supply	5,000.00
Surveys for road construction, etc.	50,000.00
Drainage works	75,000.00

Irrigation

There is a large irrigation scheme north of Vidora pending that will probably involve an expenditure of $300,000.00. The department's share in this work is surveying and organizing the irrigation area, securing the necessary authority from the government to invest the officials of the scheme with the necessary powers to raise the money from the residents of the area affected by the scheme for the cost and maintenance of the work. Beyond assisting in the organizing of the scheme, the engineering and surveys the government does not contribute towards the construction of the irrigation works. The particular scheme above mentioned is at the east end of Cypress Lake, north of Vidora.

Will the Railroads Benefit from Truck Traffic?

The Relationship of Rail and Highway Transport

Co-ordination of Motor Truck and Rail Service Will Produce Economical and Profitable Results for the Railroads

By ARTHUR H. BLANCHARD
Professor of Highway Engineering and Highway Transport, University of Michigan

What is the present attitude of railroad officials towards the development of highway transport? The answer is not a simple one to formulate as many diverse opinions have been expressed in words and actions. Some of our railroad officials appreciate the intrinsic value of highway transport and have made use of it as a part of their own transportation systems. Others have advocated its development because they know that it is necessary to the success of their business that facilities should be provided for economically transporting goods over highways to be later carried by railways. Others have been concerned regarding the development of highway transport from the standpoint of destructive competition with railroad transportation and have endeavored to curtail its development through legislative action. Others, and it is hoped that there are only a few in this class, have considered the subject from such a narrow viewpoint that they have advocated a curtailment of highway improvement.

It may appear audacious to bluntly announce that highway transport is an aid to the railroads especially in view of statements frequently appearing such as that of one railroad president who charged a deficit of $4,850,000 to motor vehicle competition. Bald conclusions of this character appearing in the public press bring to the mind of the reader the much maligned motor truck tearing up the public highways. The public does not analyze the true meaning of the loss in revenue. It does not appreciate the large percentage of reduction of railroad receipts due to the operation of the family motor car. It does not know that some railroads are experiencing a reduction in gross revenue but would not suffer a loss in net profits provided that they efficiently used their facilities for the handling of those phases of transportation for which they are pre-eminently adapted to handle profitably.

The average citizen has lost sight of the usual consequences which follow the development of a new mechanical invention of benefit to mankind and the use of which contributes to national progress. Many railroad officials appear to have forgotten what happened to canal and river traffic and profitable commercial highway transport in the days when stages constituted the only common carrier for overland transportation. The disastrous effect on the balance sheets of canal, river and stage companies of the laying of hundreds of miles of rails wherever there was an evident field for bulk or mass transportation is a chapter in the story of railroading known to all.

Railroads are not going to cease to function because of the development of highway transport. The railways are and always will be a vital part of our transportation system. They, however, have an economic field which has clearly been defined by Professor Henry E. Riggs of the University of Michigan when he said at a convention of the National Highways Traffic Association that "Railway transportation for long distance business, and for all carload business where there is direct track connection to the factory or warehouse of the shipper is and always will be more economical than any form of highway traffic." The writer is an optimist and therefore believes that the railroad official will see the light shining from the beacons of publicity and dissemination of knowledge and will soon administer his system of transportation with full recognition of the true value of highway transport to the railroads and the part which it will play in national development.

Highway Transportation Feeders

The railroads can render immediate valuable service to the public and to themselves by helping to direct the development of highway transport as feeders to rail lines and as extensions of rail service. A correct and immediate solution of the inter-relationship between these two links of our national distribution system is very desirable in the interests of public welfare.

What are the opportunities for the railroad to function as an operator or user of highway transport?

First: The transportation of freight by motor trucks from one railway terminal to another in the same or nearby city. The advantages of the utilization of highway transport, as compared with the tedious method of rail transportation by "trap" or "transfer" cars over congested tracks have been appreciated by a few railroad officials.

Second: The organized delivery with motor trucks of carload freight from public team tracks in large terminal areas. With such a system in effect, it has been stated that the present freight car equipment of the railroads would be sufficient to meet all transportation needs for several years to come.

Third: Extension of transportation service through the medium of motor truck and motor bus routes. There are several methods of development practicable in this field. Urban and interurban electric railway lines may logically expand their passenger transportation facilities through the establishment of tributary motor bus routes. During 1922, sixty electric lines throughout the United States used motor buses to supplement their rail service. Steam railroads may enter this field through the development of intercity and rural motor express lines to carry both commodities and passengers. One of the most notable examples is afforded by the highway transport services of the Great North of Scotland Railway Company which established its first motor

truck service in 1904. In 1921, this railway company was operating five passenger routes and seven intercity truck routes. Railroads having stations in scenic areas may well give consideration to another development by the Great North of Scotland Railway Company which operates from Aberdeen a motor bus line for tourist traffic.

Collection and Delivery of Freight

Fourth: The collection and delivery of freight in municipalities and adjoining areas, which is similar to the methods universally employed in large cities for handling express shipments. This phase of highway transport would be a development of what is commonly known as the store door delivery plan. A development in Michigan is the plan of the Detroit United Railway to establish a pick up and delivery system with motor trucks especially equipped to carry box containers, one or more containers being used for the freight of one shipper. In England, we find railroads functioning as operators of highway transport in this field. One of the most notable examples is the case of the London and Northwestern Railroad's comprehensive system of freight delivery by motor trucks in areas with headquarters at London, Birmingham, Manchester, Liverpool and Leeds.

Replace Unprofitable Branch Lines

W. H. Lyford, vice-president of the Chicago and Eastern Illinois Railway Company, believes that another field for the profitable use of the motor truck is the transportation of freight between communities which are served by branch lines of railway on which the traffic is too light to pay the expenses of any kind of railway transportation. He further says that no more such branch lines ought to be constructed if the highway transport operator will take over this field and occupy it intelligently and efficiently, and that money losing branch lines along which transportation by motor truck over existing highways could be furnished at less expense should be abandoned.

To cut down operating costs on branch lines, forty steam railroads are now using flanged wheel motor buses. Another development may be the reconstruction of the railroad roadbed as a private highway for the use of the railway company's trucks and trailers or its operation as a toll-road, which, if properly constructed without grade crossings for four lanes of traffic, could accommodate slow moving trucks and trailers and high speed motor buses.

Elisha Lee, vice-president of the Pennsylvania Railroad, goes a step further when he states, "The railroads still do a great deal of purely retail business. Some of it perhaps pays its way, but much of it unquestionably entails a loss. In the immediate vicinity of all our highly developed commercial and industrial communities, an immense amount of such traffic originates. A large portion of it moves only a few miles but in its handling we are obliged to employ the most costly and overworked facilities which the railways own, namely, the yards and terminals in the great centers of industry and population. Here is a real opportunity for the motor truck to demonstrate its utility upon a true economic basis. The reason why less than carload traffic, especially on the shorter hauls, is becoming a growing burden upon the railroads is that we are obliged to use it in terminal facilities and rolling stock which are too expensive for the purpose and which of necessity must be primarily planned and adapted to the handling of bulk traffic, mostly moving over the longer hauls. Therefore I believe it to be at least possible that in many instances the short haul less-than-carload freight traffic could be turned over to motor trucks with resulting advantage to the railroads and the patrons."

The views of many officials on certain phases of the interrelationship between railway and highway transport are indicated by the following excerpts from the 1922 report of the Committee on "Motor Transportation" to the National Association of Railway and Utilities Commissioners.

For Small Shipments

"Auto truck transportation meets a public demand in the rapid transit of less than carload shipments, including the door-to-door delivery element which railroads have thus far failed to furnish. Railroad companies have exhibited a degree of indifference or slowness bordering on stupidity in recognizing and meeting demands of the public for quicker and more convenient movement of less-than-carload freight.

"It is evident if rail carriers hope to retain their short haul freight traffic, it will be necessary for them to make radical changes, both in service and equipment. Trucks are rendering an astonishing service between shopping centers and outlying trading points. Country merchants prefer direct truck service to the railroads even where the cost of the service is equal, for the reason that the trucks call at the wholesale house, receive the commodities desired and unload them at the store doors. This enables the country merchants to conduct business with a smaller stock of goods, for the reason that new supplies can be obtained conveniently and on short notice through truck service.

"Another respect in which truck service is preferable, is in the movement of household goods from one town or city to another. The principal expense in shipping by rail consists in crating the household goods and preparing them for shipment. In addition to the cost of crating, is that of cartage from the house to the depot and from the depot to the house. Furthermore, these additional handlings increase the loss and damage by breakage. It is difficult of course for rail carriers to meet this sort of competition, and thus far they apparently made no effort to do so."

Saving in Crating Costs

The cost of crating for railway shipment is well illustrated in the case of the transfer of the Davis Library of Highway Engineering and Highway Transport from Columbia University in New York City to the University of Michigan in Ann Arbor. The contract price for the crating of the Library, the contents of which filled one freight car, was $1,000, while if the library had been transferred by motor truck, it would only have been necessary to box books and periodicals, the cost of which was $120. Another illustration is the case of the Remington Typewriter Company which transports from its factory in Connecticut all of its typewriters consigned to New York City by motor trucks equipped with special compartment bodies. The saving in cost of packing is $1.00 for each machine or $300 for each truck shipment.

[Address delivered at the joint session of the North Central Division of the National Highway Traffic Association and the Michigan State Good Roads Association on November 6, 1923.]

U. S. Portland Cement Production Sets New Record in October

Production of portland cement in the United States during October was the largest for any month this year and incidentally broke all records for a single month. Report of the United States Geological Survey places the total production for the month at 13,350,000 barrels compared with 13,100,000 in September and less than 12,300,000 a year ago. For the ten months ending October 31, over 114,000,000 barrels were produced exceeding last year's record output for the same period by 20,000,000 barrels or 22%.

Shipments from the mills in October were 14,285,000 barrels, an increase of about 11% over October 1922. Shipments for the ten months were close to 119,000,000 barrels or more than was shipped during the entire banner year 1922.

Stocks of cement in manufacturers' hands at the end of October were about 4,600,000 barrels or 450,000 barrels more than a year ago. Consideration of the fact that stocks of cement at the beginning of the year were very much lower than at the beginning of 1922, and the ten months' shipments have been 17,000,000 barrels greater than last year, serves to indicate how successfully the industry has coped with the increased demand. The greatly increased efficiency of the transportation systems has helped materially in making this record possible and recent increases in productive capacity have given the industry a substantially greater output.

Long Column Timber Tests

Tests on 12 by 12-in. by 24-ft. southern yellow pine and Douglas fir timbers are under way at the Forest Products Laboratory, Madison, Wis., in cooperation with the National Lumber Manufacturers' Association. The purpose of these tests is to study column formulas and laws, to obtain data on the effect of density and defects, such as knots and shakes in columns, and with these data as a basis to recommend safe working stresses for structural columns. The testing program as outlined covers a four-year period and will include tests on both green and air-dried material, ranging in quality from clear and dense to very defective and light-weight material. The timbers required for the program are divided into four shipments for delivery to the laboratory at approximately six months intervals. Tests have been completed on two shipments of green southern yellow pine and one of Douglas fir. About two years more will be required before all the tests are completed.

Japanese Government Buying Lumber in Large Quantities

The Japanese government has awarded contracts for 97,150,000 feet of lumber for use in building dwellings for Japan's homeless in the area devastated by the earthquake. All of the lumber covered by these contracts will be distributed, after its delivery at Japanese ports, among many thousands of Japan's destitute and suffering, and individuals most in need will assume responsibility for rebuilding their homes.

It has been emphasized that this and other construction of dwellings in the wrecked areas is of a temporary character. No definite plan has yet been evolved by the Japanese board of reconstruction concerning plans for permanent rebuilding. This phase of Japan's reconstruction program is moving slowly, as much research work and study will be required before the board's recommendations are transmitted to the Japanese Diet for approval.

Decline in Building Permits During October

There was a slight decline in the value of the building permits issued during October as compared with the preceding month, and the value of anticipated building was also less than in October of last year. Reports were tabulated by the Dominion Bureau of Statistics from 56 municipalities which had issued permits to the value of $9,701,080 in October, 1923, as compared with a total of $10,485,613 in September, 1923, and of $10,344,770 in October, 1922. There was, therefore, a decline of $784,533 or 7.5 per cent in the former comparison and of $643,690 or 6.2 per cent in the latter.

Forty-seven cities furnished detailed statements showing that they had issued approximately 1,400 permits for dwellings, estimated to cost nearly $6,200,000, and for over 3,000 other buildings at a proposed cost of approximately $3,400,000. It has been pointed out in previous reports that, since the construction of several buildings is frequently authorized by one permit, the number of buildings to be erected is somewhat larger than the number of permits issued.

New Brunswick, Ontario and Saskatchewan registered increases in the value of the building authorized as compared with September. The gain of $347,291 or 7.4 per cent in Ontario was actually the greatest, but the largest proportional increase (of $46,445 or 95.6 per cent) occurred in New Brunswick. Of the decreases in the remaining provinces, those of $448,288 or 38.3 per cent in British Columbia and of $391,467 or 11.6 per cent in Quebec were the largest actual declines, while the most pronounced percentage loss (61.9) was recorded in Alberta.

Quebec, Manitoba and British Columbia registered increases in the value of the permits issued as compared with October, 1922. The increase of $703,423 or 30.7 per cent in Quebec was the largest actual gain, while Manitoba, where the value of the contemplated building increased by 46.3 per cent, showed the most pronounced proportional gain. Ontario, with a decline of $1,250,760 or 19.9 per cent, recorded the heaviest loss, while that of $185,525 or 67.2 per cent in Nova Scotia was also extensive.

Montreal, Winnipeg and Vancouver registered smaller totals of prospective building than in September, but the value in those three cities was higher than in October, 1922. In Toronto, on the other hand, the value of permits issued was greater than in the month before but less than in the corresponding month of last year. Of the smaller centres, Fredericton, Westmount, Guelph, London, Ottawa, Owen Sound, Peterborough, St. Catharines, Windsor, St. Boniface, Moose Jaw, New Westminster, Point Grey and Victoria recorded larger totals of estimated building than in either September, 1923, or October, 1922.

The value of building permits issued during the first ten months of this year was slightly over 8 per cent lower than during the corresponding period of last year, but there was an increase of 18.5 per cent over the first ten months of 1921.

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The Contractor's Duty to Use Standardized Equipment

Standardization of construction equipment is a subject that should make a strong appeal to every contractor, for it vitally affects the economy of his operations and consequently concerns his pocketbook. In the United States definite progress towards standardization has been made, particularly in regard to mixers and wheelbarrows. Manufacturers of these types of equipment, under the guidance of the Associated General Contractors, have entered heartily into the movement with the result that by the elimination of unnecessary types, the number of styles of both mixers and barrows has been considerably reduced. Certain standards have been formulated, to which the manufacturers have undertaken to adhere.

The Associated General Contractors are accepting the responsibility of passing on the standards but until their standardization organization is prepared to appoint a committee to test the [illegible] mixer equipment made by the various manufacturers with respect to adherence to the [illegible] affidavits by manufacturers [illegible] indicating that equipment is complying with the terms of the coded standards. Upon receipt of each of these affidavits at headquarters, the privilege of using the standard name-plate will be granted. The plates will be furnished by the Joint Committee on Construction Equipment. The plates will be sold at nominal prices, probably ranging from thirty-five cents to $3.50, the sum being dependent upon the selling price of the equipment on which the plates are to appear. Any profit resulting from the sale of plates will be used by the Joint Committee to further the work of standardization of equipment. A form to be used by mixer manufacturers in making affidavits declaring equipment to meet the prescribed standards will be issued soon.

As regards the standardization of wheelbarrows the various manufacturing companies have made individual publications of the standards advising their jobbers of the details involved, have made requests for additional information covering specific cases from the association, have commended the work, and apparently are exercising effective means to bring about complete adoption.

It is thus evident that very considerable progress has been made, and each succeeding day lays additional emphasis upon the fact that general contractors now are entering into a position where they themselves will be responsible for the degree of fulfillment that will crown equipment standardization efforts.

Now that the actual application of the agreed standards to practice already is in its initial stage, with jobbers rapidly becoming acquainted with details being supplied by manufacturers, the duty of assuring success to this economy move is passing to the contractors. It soon will be directly and generally "up to" the purchasers of equipment to ask for the standardized types.

Bonding Practice Comes in for Criticism

More injury to public owners and to the industry as a whole is attributed, according to a news letter of the Associated General Contractors of America, to the promiscuous writing of surety bonds than to any other single cause, and at the last annual meeting of the organization a conviction was forcefully expressed that the time was fast approaching when bonding companies must answer to the public for the injurious effects of the present system. The opinion has been freely expressed not only by contractors and engineers, but also occasionally by an official of a bonding company, that just so long as any individual possessing neither experience, organization or demonstrated ability can secure a bond, the construction industry will be looked upon as the black sheep of the industrial family.

Whether the bonding companies will clean their own house before it is given a clean-up by regulatory legislation, is a matter that they alone must decide, but there appears to be little doubt in the minds of the Associated General Contractors [illegible] industry as essential and as [illegible] the construction industry will tolerate but little

longer the sinister influence exerted by the promiscuous bonding of irresponsible bidders.

In view of this opinion that association is giving the matter serious study and desires to obtain full information before outlining a recommended course of action. With this in view a number of points, listed below, are suggested as a basis of discussion, so that data, either proving or disproving the soundness of any point, may be produced.

1. Why in the face of repeated damage to public owners are incompetent and irresponsible bidders awarded contracts.

The following may be worth considering:

a. Under-valuing by public officials of the efficiency and economy in construction resulting in skillful construction management.

b. Inadequate means whereby officials can ascertain the qualifications of a bidder and make an intelligent selection with respect to a given project.

c. Acceptance of proposals from bidders known to be incapable of executing the work—possibly due to existing laws, political pressure or other circumstances which make rejection of such proposals an unpleasant procedure.

d. Failure to comprehend that a default is an expensive and injurious occurrence under any circumstances.

e. The case with which incompetent firms or individuals, professing to be contractors, may secure surety bonds.

2. How much has the premium on surety bonds been raised in the last ten years? Why? Possibly on account of:

a. An increase in the expense of procuring and administering the business.

b. A slight increase in profit.

c. An increase in the losses paid on account of defaults.

3. Why are the losses paid on account of default so great?

Some one has suggested:

a. That the surety companies bond too many firms that are incapable of executing their contracts.

b. That the increased losses may readily be covered by an increased premium.

4. How can the losses from defaults be reduced?

a. By careful investigation of the bidder's qualifications.

b. By refusing to bond any bidder incapable of performing a contract.

5. How may bond premiums be reduced?

a. Voluntarily, by the bonding companies through elimination of promiscuous bonding, thus reducing their losses.

b. Through the establishment of competition outside the bonding business by the optional use of negotiable securities in place of the surety bond.

What "Board Measure" Means

The foot "board measure," from the beginning of its use nearly one hundred years ago has meant log or timber measure, applying to lumber in the condition in which it lies in the log or in the tree, namely, as it falls from the saw, green. To predicate an argument on the application of "board measure" to so-called "commercially dry" lumber, rough, is in principle equivalent to reciting a contention that there are 17 ounces in a pound.

From the beginning of the development of the present customary rules for applying board measure in timber cruising and log scaling, the board foot has meant a section of the contents of the tree or the log 1" thick, 1' wide and 1' long, which under certain conditions could be cut from the log.

It may be that the contention is correct that the commercial measurement of lumber should be in commercially dry (or for that matter even in a surfaced) condition. The point, however, is that **such a measure** would not be "board measure" for the same reason that 17 ounces does not constitute a pound avoirdupois and 105 c.m. does not constitute a meter. If the lumber industry wants to use board measure, it should **apply** board measure and not create a new **definition** of it. The only effect of that would be a double meaning for the term "board measure."—J. W. Blodgett.

The Week's Developments in a Nutshell

It is estimated that twenty-five thousand Canadians left Canada for the United States during the past month. This is merely an estimate, as the government apparently does not keep a record of people leaving the country for permanent residence elsewhere. The Dominion Government's present efforts to bring more immigrants into Canada may, we think, well be extended to finding out how many of our good citizens are going out—and why they are going. There is little doubt that in a number of cases they are following a will-o-the-wisp, anticipating better conditions that don't exist. This means perhaps that some of them will be back in the spring, wiser and poorer. But it would seem that our government ought to get in touch with these emigrants. If they are undesirable let them go and don't let them back, but if they are desirable make every effort to hold and satisfy them.

General business conditions have improved during the last week. For example, the shoe retail trade has made a decided gain. There has been little change in the demand for building supplies. The iron and steel industry is in better shape than was anticipated. The West is regaining its old-time optimism as the effect of the bumper harvest is being felt.

Prices of building materials remain steady. Indeed this is remarkably true of all commodities. Fisher's index of wholesale prices of two hundred representative commodities which on July 1 was 154 stood at 152 on Nov. 15. During the week slight recessions were recorded for boiled and raw oil and turpentine. Fir timbers advanced 5 to 10 dollars.

Our trade figures for October, just made public, show exports again in the ascendant, by nearly twenty-four million dollars, over imports.

Hints for the Contractor

Handy Reference Tables for Making Concrete

Some very useful information for contractors, arranged in condensed form, has been published in a folder issued by the Edison Portland Cement Co., New York City. The data relates to the mix of concrete and size of stone required for various classes of work, and also to the amount of materials necessary for concrete or mortar of various thicknesses. This information is contained in Tables 1 and 2, respectively. The following explanation indicates how to use the tables, the example taken being a concrete coal bin, 6 ft. long 5 ft. wide, 5 ft. high, with walls 4 in. thick and floor 2 in. thick. In table No. 1 we find for coal bins a 1:2½:4 mixture using 1½ in. maximum size stone is recommended for best results. The coal bin has 110 sq. ft. of 4 in. thickness and 30 sq. ft. of 2 in. thickness. Hence, referring to table No. 2 under 1:2½:4 proportion, we find for 1,000 sq. ft., 4 in. thick, that we require 69 bags of cement, 171 cu. ft. of sand, and 275 cu. ft. of gravel. So, for walls of our job, of 110 sq. ft., we require about 1/10 of these materials, or 7 bags of cement, 17 cu. ft. of sand, and 28 cu. ft. of gravel. For the floor we require 30 sq. ft. of 2 in. thick. Again in the table we find, under the proper headings, the materials required, this time using 30/1000 or 3/100 of the amount required for 1,000 sq. ft. This can easily be found by multiplying the 1,000 sq. ft. amounts by .03. Adding this to the amount required for the walls we get total amount of materials required.

Table No. 1
Mixtures and Maximum Size Stone

	Max. Size Stone
1 1:1½ mixture for:	
Wearing course of two-course pavements	¾"
1:2:3 mixture for:	
One course walks, porch and basement floors, pavements and steps	1½"
Basement walls exposed to moisture	1½"
Fence posts, gate posts, benches	¾"
Sills and lintels without mortar surface	¾"
Wells and cisterns, watering troughs, tanks	1 "
1:2:4 mixture for:	
Foundations for form machinery	2 "
Concrete work in general	1½"
1:2½:4 mixture for:	
Coal bins, grain bins, silo walls, and such	1½"
Building walls above ground	1½"
Walls of pit or basements	1½"
Base of two-course floor or pavement	2 "
Mortar	
1:2 mixture for:	
Wearing course of two-course and pavements	¼"
Flower Boxes	¼"

A 1:2:3 mixture means 1 sack (1 cu. ft.) of cement, 2 cu ft. of sand, and 3 cu. ft. of pebbles or stone. The first figure is for cement, second for sand, etc.

The following explanation indicates how to use the tables, the example taken being a concrete coal bin, 6 ft. long 5 ft. wide, 5 ft. high, with walls 4 in. thick and floor 2 in. thick. In table No. 1 we find for coal bins a 1:2½:4 mixture using 1½ in. maximum size stone is recommended for best results. The coal bin has 110 sq. ft. of 4 in. thickness and 30 sq. ft. of 2 in. thickness. Hence, referring to table No. 2 under 1:2½:4 proportion, we find for 1,000 sq. ft., 4 in. thick, that we require 69 bags of cement, 171 cu. ft. of sand, and 275 cu. ft. of gravel. So, for walls of our job, of 110 sq. ft., we require about 1/10 of these materials, or 7 bags of cement, 17 cu. ft. of sand, and 28 cu. ft. of gravel. For the floor we require 30 sq. ft. of 2 in. thick. Again in the table we find, under the proper headings, the materials required, this time using 30/1000 or 3/100 of the amount required for 1,000 sq. ft. This can easily be found by multiplying the 1,000 sq. ft. amounts by .03. Adding this to the amount required for the walls we get total amount of materials required.

The folder contains the following general information of importance.

No dirt or finely powdered sand should be used.

Keep cement in dry place until used.

Sand should be clean. Gravel should be clean. Water should be clean. Tools should be clean.

All materials should be accurately measured.

Concrete should be wet enough to form a jelly-like mass but never so wet as to flow easily or soupy.

Materials Required for 1000 Sq. Ft. of Surface for Various Thicknesses of Concrete or Mortar:

C- Cement in Sacks.
FA- Fine agg. (Sand) in cu. ft.
CA- Coarse agg. (Stone) in Cu. ft.

Quantities may vary 10 per cent either way according to aggregate used.
No allowance made for waste.

Thickness in Inches	PROPORTION																							
	1 1½		1.2		1.2½		1:3		1 1:1½			1.2.3			1.2 4			1 2½ 4			1.2½ 5		
	C.	F.A.	C.	F.A.	C.	F.A.	C.	F.A.	C.	F.A.	C.A.	C.	F.A.	C.A.	C.	F.A.	C.A.	C.	F.A.	C.A.	C.	F.A.	C.A.
¾	18	27	15	30	13	32	11	34															
⅞	24	36	20	40	17	43	15	44	18	18	27												
1	36	54	30	60	25	63	22	68	27	27	41												
1	48	72	40	79	34	84	30	89	37	37	55												
1¼	60	90	49	99	42	105	37	111	46	46	68												
1½	72	108	59	119	51	127	44	133	55	55	82												
1¾	84	126	69	139	59	147	52	157	64	64	97												
2	96	144	79	158	68	169	59	177	73	73	111												
3												65	130	193	56	112	224	52	129	256	46	115	230
4												86	172	258	75	149	295	69	171	275	62	154	307
5												108	216	322	94	187	371	86	215	343	77	192	383
6												129	258	386	112	224	447	103	258	412	92	230	459
8												172	344	516	150	295	597	137	343	549	123	307	613
10												215	432	644	187	374	745	172	430	686	153	383	766
12												258	516	772	224	447	894	206	516	824	184	459	918

Table 2

Instructions for Tempering Rock Drill Steels

By F. A. McLean

The ability of a drill steel to withstand breakage, the number of times it has to be sharpened, as well as its actual cutting speed depends to a large extent on proper care in heating and tempering. The nature of the steel itself, of course, also affects the shaping and tempering of bits and shanks as well as the quality and amount of work performed. There is a direct relation between this and the cost of repairs on the drilling machine.

The following instructions on drill steel treatment issued by one of the largest manufacturers of rock drilling equipment, will no doubt be useful to contractors who use rock drills from time to time.

Furnace: Oil furnaces are very satisfactory for heating drill steel for sharpening as well as for heating for tempering shanks and bits. The flame is clean, easily regulated and free from dirt and soot. The fuel is easily carried and stored and requires less space than coal or coke.

Fuel Oil: Any fuel oil will give good results when this oil is between 23° and 28° Beaume gravity. An oil with a paraffin base is the most satisfactory although an oil with an asphaltum base can be used. This oil can be bought from any of the large oil companies.

Air Pressure: The air should be throttled down by means of valve to between 15 to 20 lbs. pressure and the oil should be under 2′ to 6′ static head or pressure. This is obtained by elevating the tank so that the bottom is 2′ to 6′ above the point at which the oil is injected into the furnaces. It is important that the air should be dry and free from moisture. It is of great importance when burning oil, to take care that not too much air is introduced into the furnace or the result will be that the steel will be oxidized and prevented from taking the proper temper.

Reheating Steel for Tempering: After the steels are forged both on the bit end and on the shank end the steel should be laid aside until perfectly cool and should be reheated for tempering both shank and bit. The steel should be laid away in a dry place, not on the wet or moist ground, and allowed to cool off slowly and when the necessary quantity of steel has been sharpened or shanked, they should be heated for tempering.

Tempering the Bit: The degree of hardness on the bit depends on the hardness of the rock for which the bit is intended and no general rules can be given. The only way is to try until the right temper is secured and a good blacksmith will be able to determine this in three or four tempers. If the bits are too hard the edges will break or chip off. If too soft the cutting edges will flatten out. The best result will be obtained when the temper is just on the edge of these two conditions. For very soft rock the temper is not so important, as the range here is very much larger than when you are drilling in hard rock. For medium hard rock we would suggest heating the steel to about 1450° F. (cherry red) and if greater hardness is required raise the temperature about 25 to 50 degrees each time till the right hardness is obtained. The heating of the bit for hardening should be as short as possible and care should be taken that hardening cracks do not occur.

Water for Hardening the Bit: The water for hardening the bit should be as pure as possible. Any alkali in the water will prevent hardening and in districts where the running water contains alkali it will be necessary to use rain water contained in a tank and cool this off with the running water by a jacket of some kind surrounding the cooling tank. If very hard bits are required a strong brine solution will give you the best hardness. The brine should be kept cool by means of running water surrounding the brine tank.

Tank for Tempering the Bits: The safest way for tempering the bit is to use in the clean water or brine tank, a grating submerged below the surface of the water. The amount of submergence will depend on the section of the bit and the temper required. The steels are heated to the right temperature, placed in a perpendicular position on the top of this grating and allowed to cool. In using this method it will be necessary to circulate the cooling water which can be done either by means of a small circulating pump or by means of a small jet of air entering the bottom of the cooling tanks.

Oil Tempering Shanks: All hammer shanks should be tempered in oil. Tempering shanks is merely a quenching proposition. The best oil for this purpose is a soluble quenching oil. The temperature of this quenching oil has no important bearing on the result. We have found it to give good results between 60° and 200°. When too hot the oil will commence to smoke badly which is an indication that the oil is too hot and should be cooled down. For a small quantity of shanks a small steel tank containing from 5 to 10 gallons will be sufficient. If the oil is not agitated the steel should be moved around while cooling. If the oil is agitated which is easily done by a small jet of air the shank can be left in the oil until cool without moving. Heat the shank to be tempered, for a distance of 7″ to 9″ to about 1600 degs. (cherry red) and cool completely in the quenching oil.

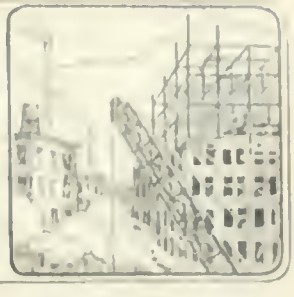
Cleaning the Quenching Oil: After continuous use and due to deposit of burnt slag and oil from the steel, the quenching oil will in time become dirty. This can be removed in the following manner. Mix the quenching oil with water about half and half in a separate tank and mix thoroughly by stirring. This cleaning tank should be provided with a spigot in the bottom. Allow this mixture to settle for forty-eight hours, then tap off the water by means of the spigot in the bottom. Again mix the oil with the same quantity of water and let stand for twenty-four hours and again draw off the water. If not perfectly clean repeat this same operation once more and the quenching oil should be absolutely clean. Care should be taken not to leave any water in the mixture.

Sharpening Bits and Shanks: In forging the bits and shanks on hammer drill steel, care must be taken not to overheat the steel as the steel may become decarbonized and so unable to be tempered. If heated too high during the forging process you will get poor results on the rock and will have excessive breakage of bits, shanks and steels.

Lumber Association's New Address

The National Lumber Manufacturers' Association have removed their Washington, D.C., offices from the International Building to the Transportation Building on the corner of H St. and 17th St.

The Building Supply Dealer—



Sorting and Grading Face Brick

Practical Information for the Building Supply Dealer Who Handles Brick—Sorting Means Service

By Howard F. White*

Generally speaking, there are three kinds of brick: smooth, matt or semi-rough, and the so-called rug or vertical scored. In the main there are also three grades: firsts, seconds and culls. Smooth brick are assorted more closely for shade and grade than the other textures as the imperfections are more pronounced. A smooth brick, whether stiff mud or dry press, has a shiny or glossy appearance and when chipped or marred the textural appearance is changed, which at times causes trouble. Possibly not so much today as in the past, but, a smooth brick is laid in a smaller joint which requires more plant care. It is not necessary in the rougher texture to be so careful because the brick are naturally rough and a slight imperfection on the face is not sufficient to call it an inferior grade. In other words, the textural effect is not materially changed.

What Are First Grade Brick?

Now we have arrived at a place of just what is a first grade, or a second grade, or culls. In my opinion, a truly first grade brick should be straight, good texture, and fairly uniform in shade. A second grade is somewhat crooked, faces chipped, corners marred and a wider range of color. Culls are what are left from the first and second grades, which can either be too crooked or not sufficiently burned to withstand weather conditions. There might be considered another grade known as "specials." At times when something goes wrong with the burning resulting in an off shade, we get what would be considered this class of material. These brick would hardly demand a first quality price although mechanically good, and it is therefore necessary to dispose of them at a reduced price. Then again, a plant is apt to get brick which would be considered something a little better than the second grade or culls. In that case, a higher price can be realized than a regular second grade or cull figure. Probably brick of this character are sold on small jobs and where the dealer or customer visits the plant and becomes acquainted with just what they are, or samples are submitted showing the range of color and quality.

On a normally well regulated plant making red brick three or four shades should be all that is necessary. From the top of the kiln the brick are slightly flashed, then come dark red, medium red and light red. However, if every brick were classified into there would be more shades, but there is always an allowable, commercial variation. Shades are more numerous in flashed brick than in clear burning and any plant is liable to get a certain amount of so-called off shades. Particularly in a rough texture where there is a good business on mingled shades, these off colors can be worked in to good advantage providing they make a proper blending. In fact, the more colors in a mixture the more beautiful the result.

Two Methods of Sorting

Generally two methods are employed in sorting one is to wheel from the kiln to tables in the open and the other in the kiln. The latter method is in greater use. After the first few bricks are taken off the top a sorter can determine how many deep will go for a certain shade and so on to the bottom of the kiln. This method is also less expensive because it eliminates double handling. Some plants employ men that do nothing but sort, but in our own plant our sorters are wheelers and vice versa. We use no helpers in the kiln and each man has to take care of his own work.

Back of it all, there are several requisites that make for economical and efficient sorting. You must have good material, it must be properly mixed and tempered, machinery in good repair, sufficient care in hacking, and efficient setting and burning. Take a gang working a kiln that is rolled and stuck and notice their attitude. They are indifferent and lose heart. But, put them in a kiln where the brick are standing nice and straight, well manufactured and a good burn, and they are happy and glad to be working for you.

I appreciate that we cannot, or rather do not, at all times have ideal conditions and have to take bitter with the sweet, but in the process before we come to sorting, skill and care should be exercised. Then, we will get a good percentage of first class ware. Understand that I have not attempted to frame excuses or alibis for kiln workers, but, brick poorly manufactured, cannot go through the different stages and come out a first quality product. The men should be made to realize that the very existence of a plant, which means their bread and butter, depends on proper sorting and if our customers continually kick on service, prestige is lost and the inevitable will follow.

Too Much "Getting By"

The term "getting by," sad to say, is possibly too much in vogue. Can we "get by" with this or that on some order. The color may be a little off or the grade not up to a standard and you take a gambler's chance. The car arrives and trouble follows. Then the unpleasantness comes of trying to straighten out the mistake. The brick may be refused and have to

*Before the Ohio Red Division of the American Face Brick Association.

be hauled from the job. You have not only lost money, but destroyed your client's faith in you and your goods. When trouble of this kind arises, it is a good plan to have the superintendent, or man in charge of the loading, inspect his service and get first hand information. Let him see the folly of his way of attempting to "get by."

To a certain extent there are two conditions that have an influence on shading and grading; one is law of supply and demand and the other labor. When demand exceeds supply and labor is scarce, the tendency is toward laxity. This is not a choice of the manufacturer, but, it is because of the independent, don't-care attitude of the men, and we, as manufacturers, cannot help ourselves and have to suffer. This gets us in bad repute and gives the industry a black eye. Sorting should be watched very carefully for it means service and service which in the end is promptness and quality is the agency on which we are to strengthen and expand our business. It is the silent advertisement of our industry.

American Construction Council has Committee on Apprenticeship

Recently the American Construction Council whose headquarters are in New York, announced the creation of a committee on apprenticeship, vocational guidance, and craftmanship with Mr. F. W. Walker, secretary of the Associated Tile Manufacturers, Beaver Falls, Pa., as its chairman. This committee cooperates with employees' and employers' organizations, building congresses, and all other elements in the construction industry, and with the educational bodies, local and national, in providing for apprenticeship which will be attractive to young men and will afford the fullest means for the employment and training of efficient workers as apprentices, and will produce the skilled workmen needed in the construction industry. A meeting of the committee will be called very shortly, probably in Buffalo during the week of December 6th.

Mason Contractors Should Study Lump Lime

Many masons prefer lump line to any other material for their work. The older men in particular are well acquainted with this material and obtain excellent results from its use. Some of the younger men, however, are not so familiar with the proper methods of handling lump line, and some times they have unfortunate experiences.

Lump lime deserves the same close attention that is given to other materials, in order to obtain the best results. A little time spent in experimenting with the brand of lime most used will be amply repaid by increased efficiency. In contrast with some other mortar and plastering materials, lump lime is obtained in concentrated form, which permits sand and water to be purchased locally at a minimum of handling costs.

There are several reasons for testing out the lime to be used, especially if it is a different brand from that to which the men on the job are accustomed. In the first place, the mortar man should know approximately how the material will slake, whether it is quick or slow-slaking, or whether it has any special action that requires a certain method of control. It is also well to know how much paste a barrel of lime will produce, and also how much the sand-carrying capacity of the paste may be increased by ageing it.

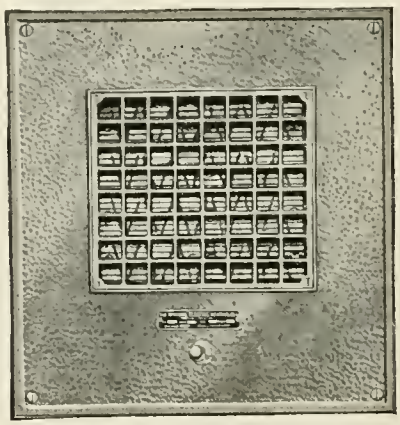
The mason contractor will do well to prepare a table for his own reference, which will give him at a glance the number of cubic feet of paste which can be obtained per barrel or ton of lump lime, and the amount of sand that a cubic foot of paste will carry at the age of two days, seven days, and fourteen days. Study should be devoted to the area covered by the sanded plaster for different types of plastering. It is well also to indicate how much lump lime is required to lay a thousand of brick or other block.

Such a table will aid materially in estimating, especially when the bid must be close. It will also help in ordering supplies and keeping the job running smoothly.

Machinery & Equipment

A Safe Electric Heater

A new product that will interest architects and contractors, and more particularly house builders, is an electric wall heater that has just been put on the market by the National Electric Heating Company, of Toronto. This heater is specially designed for bathrooms and its appearance on the market is particularly interesting in view of the serious accidents



A neat and safe electric heater installation for bathrooms

reported from time to time as a result of the promiscuous use of electric heaters in bathrooms. While it is realized that an electric heater properly installed and used is as safe in a bathroom as in any other room in the house, yet forgetfulness and carelessness is common. With this heater an accident is impossible as the heater is installed in the wall at a point out of reach of the bath; in addition to that the frame is permanently grounded. The capacity of the heater is 1,000 watts, costing one cent an hour to operate in the vicinity of Toronto. It is very handsome in appearance being finished in silver bronze or white enamel, or for special installations, as desired.

Hoist Drum Attaches to Fordson Tractor

The Fordson tractor hoist attachment, shown in the accompanying illustration, is a product of the Clyde Iron Works of Duluth, Minn. It consists of a friction drum supported in a cast steel frame and is fastened to the tractor by eight of the same bolts that

Mainly Constructional

East and West—From Coast to Coast

Forshner Bros, contractors, of Muenster, Sask., have dissolved partnership.

Crushed Stone, Ltd., of Toronto, have moved their offices from the Yonge St. Arcade to room 216 Harland-Smith Building, at the corner of Bay and Adelaide Streets.

Messrs. DeWolf and Ham, construction engineers, of Cranbrook, B. C., have moved their offices from Baker street to the Townsite Building.

Recent announcements state that the Dominion Government plan the erection of large storage elevators at Edmonton and Halifax.

The main mill of the United Shingle Company's plant on Columbia Street, New Westminster, B. C., was destroyed by fire recently. The loss is estimated at $50,000, which is fully covered by insurance. The kilns, shipping shed and boiler room were saved. J. A. McKerchar, 1050 Gilford Street, Vancouver, is the owner of the plant.

Recent reports that the Stephens Construction Company, of Campbellton, N. B., were in financial difficulties and that their plant had been seized by the Bank of Nova Scotia, have been officially denied by an official of the company who states that the company has experienced no financial trouble of any kind and that their assets are greatly in excess of their liabilities.

The city of Quebec will seek to borrow $300,000 from the provincial government to finance the construction of workingmen's dwellings. This is one of the requests that will be made at the approaching session of the government.

The drive for funds for the erection of a Masonic Memorial Temple at Montreal has been over subscribed by $212,000, the sum of $712,000 having been collected for this purpose. The site for the new temple has not been selected as yet, but a special committee will decide on this as soon as an expression of opinion has been obtained from the members as to the district desired.

The Brantford Roofing Co. Ltd., of Brantford, Ont., has taken over the Canadian Roofing Mfg. Co., of Windsor, Ont., and the machinery of the Windsor company will be installed in the additions erected to the Brantford plant this summer. Mr. C. S. Jackson, general manager of the Windsor concern, becomes sales manager of the new company, which now lays claim to the title of the largest manufacturers of asphalt roofings in Canada.

On the ground that not to accept the lowest tender would be establishing a dangerous precedent which might injure industry in the city in the future, the Board of Control at Toronto, by a majority of one, recently awarded the contract for over $200,000 worth of cast iron piping to a British firm. The tender of the National Iron Corporation, a local company, was approximately $20,000 higher.

The Engineering Institute of Canada has offered three additional prizes to its student members who are attending Toronto University. For the three best papers on some technical or engineering subject, submitted before January 31, to Professor T. R. Loudon, of the Faculty of Applied Science, the sums of $25, $15, and $10 will be given.

The Peterboro branch of the Engineering Institute of Canada held its annual dinner recently, when several prominent engineers addressed the gathering. Mr. D. W. McLachlan, M.E.I.C., engineer in charge of the proposed St. Lawrence ship canal, explained the plans for developing that route to the sea. Other speakers were Messrs. W. J. Francis,

Personal

Mr. [illegible] Chevalier has opened a [illegible] at Debden, Sask.

Mr. W. L. McKay, [illegible] attended the recent municipal convention in Western Canada.

Mr. Walter Herd has been appointed [illegible] engineer of the British Empire Steel Corporation, Sydney, N. S., and will have jurisdiction over all water and power property of the main and subsidiary companies.

Mr. W. S. Ewens has been appointed manager of the Ontario district sales organization of the Saugamo Electric Company of Canada, Limited and the Wagner Electric Manufacturing Company of Canada, succeeding Mr. R. M. Scrivener who resigned to become special agent for the Wagner Electric Corporation, of St. Louis, Mo. Mr. Ewens is a graduate of McGill University and has spent many years with the Canadian Westinghouse Company and the Northern Electric Company.

Obituary

Mr. Edward Maxwell, R.C.A., one of America's most prominent architects, died very suddenly at his residence, 312 Peel St., a few days ago. Mr. Maxwell was the son of the late E. J. Maxwell, lumber merchant, and was born in Montreal on December 31, 1867. He received his early education at the Montreal High School. His architectural career was started in the office of the late A. F. Dunlop. Later he went to Boston and was associated with the firm of Shepley, Rutan & Coolidge, returning in 1892 to take up practice in Montreal. In 1903 he founded the well-known firm of Edward & W. S. Maxwell. As memorials of his talent and energy Mr. Maxwell leaves some of the best known architectural achievements throughout the Dominion, in monumental and commercial buildings, churches, city residences, country estates and monuments, including the Art Association Building, Montreal; Legislative and Executive Buildings, Regina; Royal Alexandra Hospital, Montreal, Montreal General Hospital; Nurses' Home, Royal Victoria Hospital; the Church of the Messiah; Montreal High School; Montreal Stock Exchange; Merchants Bank Building, Canadian Pacific Railway hotels at Winnipeg, Calgary, Vancouver, and the Chateau Frontenac at Quebec, the city residences of the general manager of the Bank of Montreal, C. R. Hosmer, the late R. B. Angus, the late Senator Forget, L. T. Davis, and Sir Vincent Meredith.

Trade Incorporations

Belanger Papineau, Limitee, with head office at Cornwall, Ont., capital $100,000, to carry on an engineering and contracting business.

Ideal Housing Co. Ltd., with head office at Aylmer, P. Q., capital $20,000, to carry on a building and real estate business.

The National Marble, Limited, with head office at L'Annonciation, P. Q., capital $[illegible] to quarry and deal in marble and other products.

Metropolitan Contractors, Limited, with head office at Montreal, capital $25,000, to manufacture, sell, [illegible] ing machinery, etc.

CONSTRUCTIONAL ACTIVITY

Period of November 21 to November 27, 1923

Dominion Wide Service Exclusive to "Contract Record & Engineering Review"

Waterworks, Sewerage and Roadways

Hamilton, Ont.
The city council contemplate opening and improving the following streets: Dunsmure Rd. from Roxboro Gardens limit to Beaconsfield Park addition. Work will start this fall or early spring. W. L. McFaul is the engineer in charge of work.

The laying of sewers in Hunter St. from Ferguson Ave. to Walnut St., and Robert St. from James to John St., is proposed by the city council.

The city council contemplate paving Bowen St. from Jackson St. to Main St., and Main St. rom Kenilworth Ave. to city limits.

Headingly, Man.
A. Melville, 5 National Trust Bldg., Winnipeg, is preparing plans of a sewage disposal system here. Owner is J. Kenaston, Minneapolis, Minn.
Contracts Awarded

Hespeler, Ont.
Tenders have been received by the town council for waterworks extension.

Laprarie-Lacolle Highway, Que.
Tenders are being received by the Dept. of Public Highways, through the deputy minister, J. L. Boulanger, Parliament Bldgs., Quebec, for the resurfacing with an oiled waterbound macadam of 4,074 feet of roadway.

Mosa Twp., Ont.
The township council contemplate a drainage system here.

Simcoe, Ont.
Plans are being prepared for sanitary sewer extension on Victoria St. from Sherman to Pond. G. R. Marston is the engineer.

CONTRACTS AWARDED

Ellice Twp., Ont.,
The contract for drain improvements has been awarded by the township council to John F. Crowley, R. D. No. 1 Sebringville, at $3,073.

Niagara Falls, Ont.
Contract for sewer work has been awarded by the city council to J. H. McKnight Construction Co., Ltd., Toronto. Earth excavation $1.70 per cu ft.; rock excavation $6.00 cu. ft.

Portage La Prairie, Man.
The contract for outfall sewer has been awarded to Fowler, Young & Holden Co., Ltd., Winnipeg, at $77,475.

Toronto, Ont.
The contract for iron pipe has been awarded by the city of Toronto to Francis Hankin & Co., Ltd., 386 King St. W., at $228,219.75.

Winnipeg, Man.
Thos. Jackson & Sons, 370 Colony St., have been awarded the contract for sewers at $3,200.80.

Railroads, Bridges and Wharves

Dartmouth, N. S.
Tenders are being received till December 18, by Dept. of Public Works, through the secretary, L. H. Colman, Parliament Bldgs., Ottawa, Ont., for construction of a wharf here. Plans and specifications at offices of the district engineers, Bellevue building, Halifax, Custom House Bldg., St. John, N. B., and at Post Office, Dartmouth, N. S. A 10% accepted cheque required.

Niagara Falls, Ont.
Tenders are being received till December 1 by superintendent, J. H. Jackson, for the construction of 2 concrete arch bridges in Queen Victoria Park. Plans and specifications with owner. Queen Victoria Park Commission. A 5% accepted cheque required.

Three Rivers, Que.
Oscar Arcand, 476 Notre Dame St. has been appointed engineer in charge of rebuilding bridges on St. Maurice River. Cost of this work will be $160,000.

Yamachiche, Que.
New plans are to be prepared for $10,000 concrete bridge over River Yamachiche. Ivan E. Vallee, Quebec, Que, is the engineer in charge of work.

CONTRACTS AWARDED

Baie St. Paul, Que.
Methot & Fournier, Montmagny, Que., have been awarded the contract for construction of wharf in River du Gouffre, at $11,068.75.

Cocagne Cape, N. B.
John W. McManus Co., Memramcook, have been awarded the general contract for wharf and roadway approach at $12,910.

St. Louis de Terrebonne, Que.
Belanger & Sicotte, 83 Craig West, Montreal, have been awarded the general contract for $60,000 bridge to be erected between St Louis de Terrebonne and Ste. Rose de Laval, Que. Engineer in charge of this work is Ivan E. Vallee.

Toronto, Ont.
Roger Miller & Sons, Ltd., Lumsden Bldg., have been awarded the general contract for grading work for Toronto Suburban Railway Company.

York Twp., Ont.
Work is in progress for construction of $80,000 concrete arch bridge at Governors Rd. Contract for waterproofing has been let to Western Waterproofing Co., Toronto. Goldie Construction Co, are the general contractors. F. J. Engholm, 56 Huntley St., Toronto, is the engineer.

Public Buildings, Churches and Schools

Gaspe, Que.
Pierre Levesque, 115 St. John St. Quebec City, is preparing plans for a fireproof seminary at Gaspe, to cost $125,000.

Halifax, N. S.
Childrens Hospital Board contemplate an addition to Childrens Hospital to cost $50,000.

Jonquierre, Que.
The building of a new school is contemplated by the School Board. 3 stories, 32 x 52, brick veneer construction.

Kingston, Ont.
Sealed tenders will be received by the registrar, W. E. McNeil, till December 12, for interior finished woodwork and ornamental iron work required for the library building of Queen's University. A marked cheque to the order of the treasurer, Queen's University, for 5% of amount of tender is required. Drawings and specifications may be seen at the offices of the registrar in Kingston and the Bulders' Exchange, Toronto, or they may be had upon deposit of $15.00 by applying to the architects, Shepard & Calvin, 36 Toronto St, Toronto.

Limoilou, Que.
Lorenzo Auger, 39 St. John St., Quebec, Que., is preparing plans of public parish hall to be built on 8th Ave.

Montreal, Que.
Chas Davis, 3 Burnside Place, is preparing plans of school to be built corner Hadley and Jacques Hertel for R. C. School Commission.

Megantic, Que.
The school board contemplate the erection of a school here. 3 storeys 40 x 50, brick veneer construction.

Ottawa, Ont.
The erection of a $50,000 civic building on Canal St., is proposed by the city council.

Rosetown, Sask.
A By-law is to be submitted on December 10 for $50,000 addition to hospital.

St. Maxime de Scott, Que.
Jos. P. Ouellet, 28 St. Famille, Quebec, Que., is preparing plans for completion of interior of church for R. C. Parish. Tenders will be called in about one month.

St. Martin, Que.
The School Board contemplate building a new school here.

St. Alphonse de Caplan, Que.
The R. C. Parish contemplate building a $50,000 church here. Curate is

Rev Boullon, New Carlisle, Que No materials purchased.

St. Hilarion, Que.
Wilfrid Lacroix, 142 St Peter St., Quebec, Que., is preparing plans of $100,000 church here. Owner and curate is Rev Philippe Tremblay

St. Catharines, Ont.
The city council contemplate building a stadium corner Woodland and Maple Sts., estimated to cost $50,000 J A Pay is the engineer in charge Work will start in spring.

Three Rivers, Que.
Asselin & Denoncourt, 12 Alexandre St., are preparing plans of $55,000 residence for Brothers to be built on St. Philippe St City council is the owner No. Materials purchased 3 storeys, 32 x 100, brick construction.

Timmins, Ont.
Frank Valois, Timmins, Ont., has the painting contract on $120,000 high school being built here Schultz Bros & Co., Ltd., 35 Albion St., Brantford, are the general contractors. Architects Pennington & Boyd, Windsor; associate architect, J. W. Leighton, Windsor

Toronto, Ont.
The walls are up for $100,000 addition to Methodist church at 310 Danforth Ave Electric and plastering trades to be let. Architects, G M. Miller & Co., 93 Yonge St

Varennes, Que.
Tenders are being received till December 1 by the architect, Raoul Gariepy, 15 St. James St., Montreal, for addition to convent owned by Soeurs Ste. Croix Plans and specifications with architect.

Weston, Ont.
Mason Lodge No 523 contemplate building a hall on Main St. 1 storey, brick construction Building Committee is S. J Totten and C. Lorne Fraser.

Weedon, Que.
J. W Gregorie, 16 Wellington St., Sherbrooke, Que., is preparing plans of $8,000 church and rectory for R. C Parish. Tenders for this work will be called in about three weeks.

CONTRACTS AWARDED

Brandon, Man.
The following sub-trades have been let on hospital being built here; millwork—Brown & Rutherford, Winnipeg, at $10,700; ornamental iron and bronze—Vulcan Iron Works, Ltd., at $26,900.

Burns Lake, B. C.
Brown & Robb are the general contractors of $14,990 school to be built here.

Caledonia, Ont.
Foundations are going in for High school being built here. Contract for steel work has been let to Hamilton Bridge Works Co., Ltd., Toronto. W W. Petley & Co, Toronto, are the general contractors. Architects, Walker & Gibson, 82 King St. E., Toronto.

Claremont, Ont.
Geo Hubbert, 195 James St., Toronto, has the contract for painting, and Hobbs Mfg. Co., the contract for glass and glazing in connection with $35,000 school being built here. General contractors are W W. Petley & Co. Architects, Walker & Gibson.

Edmonton, Alta.
City of Edmonton has awarded Montreal Royal Metal Company, Montreal, Que., the contract for lead pipe at $3,148.50

London, Ont.
The following sub-trades have been on $18,000 parish hall being built for St George Anglican Church, brickwork—R N Southern, 20 Renwick Ave., steel London Bridge Ltd W L Dodd, 148 King St., London, is the general contractor Architect John M Moore, 449 Richmond St.

Lewis Bros., 179 Mill St., have the contract for painting $250,000 science building being erected for Western University Jno M Moore, architect, 449 Richmond St., wants prices immediately on laboratory equipment, estimated cost $50,000 General contractor is Jno. Putherbough, 96 Talbot St

The following sub-trades have been let on $50,000 sunday school and gymnasium for Knox Church Congregation, plastering—Slade & McWain; electric—Bowley Electric Co.; painting—J C Fitzgerals, 585 Princess Ave L B Kerr, 196 Simcoe St., is the general contractor Architect, W G. Murray, Dominion Savings Building

Montreal, Que.
The following sub-trades have been let on $90,000 hospital being built for Soeurs de la Misericorde; roofing—M. Chouinard, 751 Adam St.; plumbing, heating, ventilating and skylights—J A Francocur & Cie.; plastering—G. Rochefort, 273 Valois; ornamental iron and fire escapes— Montreal Architectural Iron Works, Ltd.; elevators—Otis Fensom Elevator Co, Ltd. Painting and glazing by general contractors, Ulric Boileau, Ltd. Refrigerators, marble and tiling to be let. Architect, J. E C Daoust, 180 St. James St.

Following sub-trades have been let on $65,000 convent being built here for Sisters of Immaculé Conception; roofing, plumbing, heating and ventilating—J. E. Hardy, 1470 Papineau; plastering—G Rochefort, 273 Valois; slate—E LePage, 990 Parthenais; painting and glazing—Bruno Navert, 1229 St. Dennis. Architect, Jos Sawyer, 407 Guy St.

Brickwork is going up for $42,250 presbytery on Dorion St. for Parish Ste Marguerite-Marie-Alacoque. Following sub-trades have been let; millwork—H. Chagnon & Cie; roofing—M. Chouinard, 751 Adam St.; electric— J. V St. Amour, 2171 St Denis; plastering—G. Rochefort, 273 Valois. Tiling to be let. Painting and Glazing by general contractors, Ulric Boileau Ltee. Architect, E. V Doucet, 195 St. Catherine E; associate architect, Ernest Cormier.

Outremont, Que.
The following sub-trades have been let on school being built on Lajoie Ave.; marble and tiling—Brown & Son; roofing—Wm Rutherford & Son Co, Ltd; Plastering—C.Hayward, 226 Regent St McRitchie & Black, 14 Sussex Ave are the general contractors Architects, MacVicar & Herior, 628 Union St.

Ottawa, Ont.
Contract for building botanical laboratory has been awarded to Taylor & Lackey, Trust Bldg, at $24,084.

Springhill, N. S.
[illegible] has been awarded the contract for plumbing and heating for [illegible] and Police station, at a cost of $15,000 [illegible] Contractors are Drummond & Gordon, Montreal. J. E. Wells is the engineer in charge of work

St. Catharines, Ont.
The walls are going up for $150,000 terminal building corner Geneva St and Welland Ave The following trades have been let, steel—Hamilton Bridge Works Co, Ltd, reinforced steel—Le-troy Engineering Co Ltd General contractors are Frid Construction Co Hamilton

Sudbury, Ont.
Work is in progress for $100,000 church being built on Beech St., for R C. Episcopal Corporation of the Diocese of Sault Ste Marie Grant & Hitchcock have the contract for plumbing Architect, P J O'Connor, Stafford Block

Saskatoon, Sask.
The following contracts have been awarded on Tuberculosis Sanitarium to be built here; general contract Smith Bros & Wilson Ltd., Regina, at $181,000; structural steel—Dominion Bridge Co. Ltd, Winnipeg, $75,221, ornamental iron—Dominion Bronze & Iron Ltd, Winnipeg, $18,280, electric—Sun Electric Co. Ltd., Regina, $18,405; plumbing and heating Northern Plumbing Co., Saskatoon, $77,767, lath and plaster—George Pinder, Saskatoon, $26,748, painting—Robinson & Co., Regina, $29,400; tile—Regina Marble & Tile Co, Ltd., $13,460; roofing and sheet metal—V L. Charlebois, Saskatoon, $21,95

Waterville, N. S.
E. R. Goucher Berwick, N S has the contract for electric work on $12,000 church being built for Methodist & Presbyterian Union Comm Balance of work by general contractors J H Hicks & Son, Bridgetown, N S

West London, Ont.
The following sub-trades have been let on $400,000 arena being built here, roofing—Brownlee Hardware Co., electric—Knowles Electrical Co painting—W T. Page, 251 Rideau St., tile—Ontario Denison Tile Co, Ltd Windsor, Ont

Windsor, Ont.
Coulouttti Bros., 612 Langlois Ave., have the contract for terrazzo work and Pennington & Lang the contract for roofing on separate school being built on Campbell Ave Maxlow & Gale are the general contractors Architect G J P. Jacques

Business Buildings and Industrial Plants

Cereal, Alta.
Work has commenced on repairs to grain cleaner [illegible] Canada Grain Growers Co. [illegible] are the owners and will purchase material and sub-let trades

Chemainus, B. C.
Victoria Lumber Mfg. Co. are having

plans prepared for the erection of a lumber mill here.

Hamilton, Ont.
Wm. Carroll, 19 Hughson St. S., contemplates building a $60,000 warehouse on Humber St. between Bailey and Walnut

Kingston, Ont.
The Dye & Chemical Co. of Canada, Ltd., contemplate building a factory here, to cost $25,000.

R. W. Catto, 47 King West, Toronto, is preparing plans of an hotel to be erected here. 7 storeys and basement, 190 x 70, reinforced concrete construction.

Lachine, Que.
Frank Penden, 65 McGill College Ave., Montreal, is preparing plans of $50,000 club house for Lachine Links Construction Co., Ltd., 26 Victoria Sq., Montreal.

Mitchell, Ont.
Burritt Knitting Mills contemplate an extension to their factory here.

Orillia, Ont.
Canada Wood Specialty Co., Ltd., contemplate building an $85,000 factory corner Front and Coldwater Sts.

Riviere De Loup, Que.
Lorenzo Auger, 39 St. John St. Quebec, is preparing plans of a hall for Knights of Columbus.

St. Catharines, Ont.
Nicholson & MacBeth, 46 Queen St., are preparing plans of stores, offices and lodge, to cost $50,000, for Union Lodge, I.O.O.F. No. 16. Tenders are being received by architects, till December 17. Plans and specifications with architects.

Toronto, Ont.
Canadian Bank of Commerce has purchased a site on north west corner North Yonge and Elginton Ave. for erection of branch bank.

The walls are going up for $15,000 brick plant corner Spears and Northland Aves., owned by Hinde Bros., 134 Northland Ave. Work day labor by owners.

Walls are going up for $150,000 addition to lunch room at 11-13 King East. Roofing, plastering and painting trades to be let. W. T. Joy, 86 High Park Ave. is the general contractor. Architects, N. A. Armstrong Co., Ltd.

CONTRACTS AWARDED

Brockville, Ont.
Following sub-trades have been let on 3 stores and apartments being built north side King West between Court House Ave. and Buell St., for E. Cancilla, 170 King West; roofing—Henry Bedard & Son; heating—John Semple; painting—John Carberry. Electric and plastering to be let. W. E. Brown, 141 King West is the general contractor.

Ford, Ont.
Merlo, Merlo & Ray, have the contract for excavation work for $35,000 branch bank of Provincial Bank of Canada. Windsor Construction Co., Ltd., Walkerville, are the general contractors. Architect, G. J. P. Jacques, 3 Ouellette Ave. Plastering, painting, electric, plumbing and heating to be let

Hamilton, Ont.
Thos. Irwin & Son, 22 McNab St, have the roofing contract for $15,060 store and office building being built corner Kenilworth and Barton Sts. Donaldson & Patterson, 229 Bay S., are the general contractors.

Kirkland Lake, Ont.
F. R. Gibson, Haileybury, Ont., has the contract for plumbing and heating of branch bank being built here for Imperial Bank of Canada. Electric, plastering and painting by general contractors, Hill, Clarke & Francis, New Liskeard. Architect, W. L. Somerville, 2 Bloor W., Toronto.

Montreal, Que.
M. Robert, 627 Mount Royal East, is owner and builder of $12,000 store at 329 Delaroche. Foundations and brickwork—C. Frenette, 331 Delaroche. Carpentry, millwork, roofing, electric, plumbing, heating, plastering, painting and glazing to be let.

General contract for garage to be built on St. Lawrence near Mile End Station, has been awarded to Jules Taralli, 186 St. Margaret, at $70,000, and not to N. Block, 207 Wellington as previous reported. Owner is M. Block 207 Wellington.

Ottawa, Ont.
Doran Construction Co., Ltd., 104 Sparks St., have the general contract for $7,000 warehouse on Copper St. for Snelling Paper Sales. 25,000 bricks and materials for 70 cu. yds. of concrete required.

Toronto, Ont.
John Cummings, 417 Beresford Ave., has the general contract for garage and service station to be built on Dundas St. W. near Watkinson Ave., for Cummings & Bunt, 2742 Dundas West. Carpentry day labor. Masonry, roofing, electric and structural steel to be let.

Tile walls are going up for $50,000 ice plant on Browns Ave. for Chapmans Ltd Following sub-trades have been let; electric—Salisbury Electric Co, Ltd.; heating and plumbing—Sheppard & Abbott. General contractors are Witchall & Son. Architects, Chapman & Oxley.

The walls are going up for $175,000 office building corner Gerrard and Yonge Sts, for Canada Life Assurance Co. Contract for millwork has been let to R. Laidlaw Lumber Co., Ltd. General contractors are P. H. Secord & Sons Construction Co., Ltd. Architects are Sproatt & Rolph.

Dowling & Williams, 167 Yonge St., have been awarded the general contract for $125,000 light manufacturing building to be built at 207-215 Richmond West, for Gelber Bros. Ltd. Architect, Benj. Brown, 287 Spadina Ave.

The foundations are going in for addition to Capital theatre, stores and offices, corner Castlefield Ave. and Yonge St. Followng sub-trades have been let; masonry—J. Copp, 31 Balmoral Ave; steel—McGregor & McIntyre; stone—J. H. Jackson, Shaftsbury Ave. Carpentry day labor. Oother trades still to be let. Owner is R. McClelland, Capital theatre. Architect, Murray Brown, Confederation Life Bldg.

Work is in progress on alterations to store for cafeteria, 185 Yonge St. Following sub-trades have been let; terrazzo floors—Italian Mosaic & Marble Co.; rubber floors—Canadian I. T. S. Rubber Co. Painting to be let.

Hocken & Kelly, Dovercourt Rd., have the contract for masonry work on $13,000 public garage at 1882-4 Yonge St., owned by McCann Bros. Carpentry day labor. Heating and plumbing by owners. Plastering, electric and painting to be let.

Foley & McTague, 89 Malvern Ave., and David McKay 287 Ashdale, the concrete and brckwork for $10,000 theatre north east corner Woodbine and Danforth Aves. W. A. Summerville, 478 Danforth Ave. is the owner. Architects, J. Hunt Stanford & Son, 67 Yonge Arcade.

Vancouver, B. C.
H. H. Fisher, 305 Pender St. W., has the general contract for repairs to bank building on Hastings St. W.

Weston, Ont.
C. Brookbanks is the general contractor for $12,000 drug store to be built on Main St., corner John, for W. J. Inch, Main St.

Residences

Anerdon Twp., Ont.
The walls are going up for $25,000 residence on River Front. Owner and architect is John J. Comerford, care Detroit Lumber Co., Detroit, Mich., and looks after all work.

Bagotville, Que.
Armand Simard, Bagot St., is the owner of $18,000 store and residence being built on Bagot St.

Bulyea, Sask.
Storey & Van Egmond, Regina, Sask., are preparing plans of $9,000 residence to be built here. Math Anderson, of Bulyea, is owner and general contractor.

Hamilton, Ont.
W. T. Dyment, 895 King E. contemplates building a number of residences on Crosthwaite Ave., Beaconsfield Park, and will let trades.

Witt, Bull & Oxford, 124 Edgemont, will build 16 residences on Cameron Ave. and will let trades.

Excavation work is being done for $10,000 residence on Flatt Ave. Wm. Inrigg, 160 Flatt Ave., is the owner and general contractor and is receiving tenders on all trades. No material purchased except brick.

John McQuillan, 668 Main East, contemplates building 21 residences on Cameron Ave., in Roxborough Gardens. Roofing, electric, heating, plumbing, plastering and painting to be let by owner. No materials purchased.

Work has started for 3 residences, $12,000 being built on Maple Avenue. Owner and general contractor is Ellis V. Atkinson, Turner Bldg.

London, Ont.
Tenders are being received till December 1 by the architect, John M. Moore, 189 Richmond St., for remodelling residence for apartments, costing $12,000.

Plans and specifications with architect Prices wanted on all materials

Montreal, Que.

W. Larivière, 1422 Blvd Gouin is owner and general contractor of 2 residences, $9,000, on Vianney Ave near Blvd Gouin. Painting and carpentry by day labor Electric, plumbing, plastering, roofing and masonry to be let No materials purchased

E. Iddon, 254 Notre Dame de Grace Ave is owner and builder of 3 residences, $20,000, on Maytair between Terrebonne and Monkland Masonry, millwork, roofing, plastering, heating, plumbing, painting and glazing to be let

L. Jerome, 3045 St. Dominique, is owner and builder of 2 residences, $12,000, on Henri Julien between Villeray and 32nd Ave Brickwork, millwork, roofing, electric, plumbing and plastering to be let

Foundations are going in for 2 residences, $12,000 on Esplanade, Ave. Wm. Deslauriers, 469 Old Orchard, is the owner and builder. Brickwork, millwork, roofing, electric, plumbing, plastering, painting and glazing to be let.

Excavation work is being done for 3 flats, $10,000, near 4331 Notre Dame St. E. A. Lefebvre, 4331 Notre Dame E. is the owner and builder. Architect, J. A Robert, 293 Workman. Brickwork, millwork, roofing, electric, plumbing, heating and plastering to be let.

Alex. Bremner, 229 St. Catherine Rd., is owner and builder of 2 cottages, $18,000, on St. Catherine Rd., corner Laurier Ave., and will let sub-trades privately.

Excavation work is being done for $15,000 residence on Prudhomme, between Sherbrooke and Cote St. Antoine. Architect is J. A. Robert, 293 Workman. Owner and builder, E. Berthiaume, 132 Joliette. Brickwork, millwork, roofing, electric, plumbing, plastering, painting and glazing and tiling trades to be let.

Lancashire Land & Construction Co. are the owners and builders of 4 residences, $28,000, on Marcil, near Notre Dame de Grace Ave. Brickwork, millwork, roofing, electric, plumbing, heating, plastering, painting and glazing and tiling to be let.

Excavation work is being done for $21,000 residence on Laurier, corner Fabre. A. & D. Boileau, 245 McDougall Ave., are the owners and builders. Masonry, millwork, roofing, painting, plastering, plumbing, heating, glazing and electric to be let.

L. Doyon, 334 Decarie Blvd., is owner and builder of 2 residences, $15,000, on Brillon, between Marlowe and Northcliffe. Sub-trades to be let.

J. Hand, 4857 Sherbrooke W., is the owner and builder of $20,000 residence opposite 916 Grosvenor Ave. Millwork, roofing, electric and tiling to be let.

Excavation work is being done for $15,000 residence on Chambord, between Beaubien and St. Zotique G. Rathelade, 53 Marquette, is owner and builder. Roofing, electric, plumbing and plastering to be let. Masonry, carpentry and painting by day labor.

Foundations are going in for $9,000 residence on Alma, north east corner Belanger. Owner and builder is A. Gagnon, 27 Belanger No materials purchased. Millwork, roofing, electric, plumbing and plastering to be let Brickwork by owner.

Foundations are in for 4 residences, $20,000, on Wurtele, between 36th and 40th Avenues R Lortie, 36 Wurtele, is the owner and builder Brickwork, millwork, roofing, electric, plumbing and plastering to be let.

Jos Giguere, 302 St. Catherine East, is the owner and builder of 3 residences, $18,000 on St. Denis, between 34th and 35th Avenues Brickwork, roofing, electric, plumbing, plastering, painting and glazing trades to be let

Mimico, Ont.

W. A Guy, 141 Northcliffe Blvd., Toronto, is owner of 2 residences, $5,500 each, being built on Albani St Masonry, plastering, electric, plumbing and heating to be let Carpentry by owner.

Ottawa, Ont.

Millson, Burgess & Hazelgrove, are preparing plans for altering residence into apartment house on Cartier St. Lt. Col. E. R. McNeil, Queen St., is the owner.

Pointe du Lac, Que.

Zephir Pratte is the owner of $12,000 residence being built here. Masonry, electric, plumbing, heating and plastering to be let.

Sorel, Que.

P. J. A. Gardin Deputy, Roy St., is the owner and builder of $10,000 residence on Roy St. No material purchased except brick. Architect is J. P. Herouz, 105 George St.

The walls are going up for $25,000 apartment house on Roy St. J. S. B. Leclaire, Roy St., is owner and builder. Architect, J. P. Heroux, 105 George St. Roofing, electric, painting, plumbing, plastering, glazing and heating to be let.

St. Laurent, Que.

Foundations are going in for $8,000 residence on Monkland Blvd. J. O. Authier, 220 Principale St., is owner and builder. Brickwork, millwork, roofing, electric, plumbing, heating, plastering, painting and glazing trades to be let.

Three Rivers, Que.

Adolphe Proulx, 314 Ste. Cecile, is owner and builder of $10,000 tenements on Ste. Cecile St. Electric, plumbing, heating and plastering to be let.

Toronto, Ont.

The footings are in for 2 residences, $5,000 each, east side Northcliffe Blvd., near Rogers Rd. Owner and builder is Brook Sykes, 7 Boon Ave., who employs regular staff. Painting, plastering, heating, electric and plumbing to be let.

The walls are going up for 2 residences, $8,000 each, north side Chaplin Cres., near Colin Ave. Glendale Investments, Ltd., are the owners and builders. Electric, painting, plumbing, plastering and heating trades still to be let.

Tenders are being received by the owner, Dr. A. Semple, 941 College St., in connection with $8,000 residence to be built on Humberside Rd. N. A. Armstrong Co., Ltd, are the architects.

Work is to start shortly for $12,000 duplex residence corner Indian Rd and Algonquin Ave. Wm. J. Brown, 130 Indian Rd, is the owner. No material purchased.

[illegible] owner and builder of [illegible] on Humberside Rd., corner Humberside Ave. Carpentry and labor Masonry, [illegible] plastering, heating, glazing and electric to be let No material purchased. Owner buys

Bailey Bros., 30 Norton Rd are the owners and builders of 2 residences $4,500 each at 1357 Gerrard Ave. Electric, heating and plumbing to be let

Geo K. Finn, 20 Melville Ave is owner and builder of duplex residence at 585 Melville Ave and is receiving tenders on plastering, plumbing, electric heating and painting Carpentry and masonry day labor

Footings are in for 2 residences, $4,500 each, at 1135 Blackthorne Ave. Owner and builder is Arthur Lord, 60 Blackthorne Ave Painting, electric, plastering, plumbing and heating to be let.

Glendale Investment Co., Ltd., are the owners and builders of 2 residences, $8,000 each, being built on north side Chaplin Crescent, near Colin Ave., and will let electric, painting, plastering, heating and plumbing trades Carpentry and masonry by day labor.

Foundations are going in for 2 stores and apartments, $8,000 each, west side Yonge St., near Bedford Park Ave. Weismiller & McKenzie, 2003 Yonge St., are the owners and builders and employ regular staff and buy materials as required. Carpentry and masonry by day labor.

Foundations are going in for $8,000 residence south side Rochester Ave., near St. Ives Ave. Owner and builder is John W. Scott, 576 Church St Electric, painting, plastering, heating and plumbing to be let by owner. Masonry by day labor.

Independent Builders Ltd., 2782 West Dundas St., are the owners of 2 residences, $4,000 each, being built north side Millwood Rd., near Horwood Rd. Carpentry and masonry day labor Plastering, electric, painting, heating and plumbing to be let by owners.

Foundations are going in for 2 pair residences, $7,000 a pair, south west corner Manor Rd., near Cleveland Ave. Owner and builder is V. Fountain, 870 Broadview Ave. Masonry by day labor Plastering, electric, painting, heating and plumbing to be let by owner

French Bros., 32 Earl St., are the owners and builders of 3 residences, $12,000, north side Northcliffe Blvd., near Rogers Rd. Tenders are being received on electric painting, plastering, heating and plumbing

Foundations are going in for 4 pair residences, $6,000 a pair, east side Henning Ave., near Lumsden Ave. Geo. Nicholson, 6 High Park Gardens, is owner and builder Painting, plastering, heating, electric and plumbing to be let by owner Carpentry and masonry by day labor

Loxall Tile Co., 18 Clifton St., are the owners of 4 pair residences, $4,500 each, east [illegible] Ave., near Vaughan Rd. [illegible]

Wm. Arthur [illegible] owner and builder of 2 residences, $12,

Tenders and Proposals

Official Notices by Governments, Municipalities, Architects and Engineers

Niagara Falls, Ont.

Tunnel Excavation

Sealed tenders addressed to the undersigned and endorsed "Tenders for Tunnel Excavation," will be received until twelve o'clock noon,

Saturday, December 1st, 1923,

for the extension of the Scenic Tunnel at Table Rock, Niagara Falls, Ontario.

Plans may be seen and specifications with form of tender obtained at the office of the Queen Victoria Park Commissioners, Niagara Falls, Ont. Tenders must be accompanied by a marked cheque for at least 5% of the amount of tender.

The lowest or any tender not necessarily accepted.

(Sgd.) JOHN H. JACKSON, Supt.,
Queen Victoria Park,
Niagara Falls, Ont.

Niagara Falls, Ont.
November 17th, 1923. 47-48

Tenders for Concrete Arch Bridge

COUNTY OF PETERBORO

Sealed tenders will be received by Ed. M. Elliott, County Clerk up till 2 p.m.

Tuesday, January 22nd, 1924,

for the construction of a concrete arch bridge at Lakefield, Ontario.

The bridge consists of 2 open spandrel arch spans of 149' and 81' with 20' roadway and one 6' sidewalk, the total estimated quantity of concrete being 658.3 cu. yds.

Intending bidders are advised to see the site at once.

Plans and specifications may be seen at the Offices of the County Clerk at Peterboro, the Village Clerk at Lakefield and the Undersigned.

A marked cheque or bid-bond for 5% of the amount of the tender must accompany it as guarantee of good faith.

The lowest or any tender not necessarily accepted.

A. W. CONNOR & CO.,
County Engineers,
31 Victoria St., Toronto.

48-49

FOR SALE

Ten Ton Holt Caterpillar Tractor

For sale at decided bargain, as owner has no further need for same.

Box No. 407, Contract Record, Toronto. 44 T.f.

RATES

20 cents per agate line (14 lines to the inch) Position Wanted 1 cent per word per insertion. Positions Vacant 2 cents per word per insertion. Box number 10 cents extra. Advertisements for this Section must be received not later than noon on Tuesday to ensure insertion in Wednesday issue.

Niagara Falls, Ont.

Tenders for Two Concrete Arch Bridges

Sealed proposals addressed to the undersigned and endorsed "Tender for Concrete Arch Bridges" will be received until twelve o'clock noon

Saturday, December 1st, 1923,

for the construction of two concrete arch bridges.

Plans and specifications may be seen and form of tender obtained at the offices of the Queen Victoria Park Commissioners at Niagara Falls, Ontario.

Each tender must be accompanied by an accepted cheque made payable to the order of the Queen Victoria Park Commission for at least 5% of the amount of the tender.

The lowest or any tender not necessarily accepted.

JOHN H. JACKSON,
Superintendent.
Queen Victoria Niagara Falls Park Commission,
Niagara Falls, Ontario.

47-48

TENDERS

Sealed tenders addressed to Dr. W. E. McNeill, Registrar, Queen's University, Kingston, Ont., will be received up to noon of

12th December, 1923,

for Interior Finished Woodwork, Ornamental Iron Work, required for

Library Building, Queen's University, Kingston, Ont.

Each tender must be accompanied by a marked cheque to the order of Treasurer, Queen's University, for 5% of the amount of the tender. Cheques of unsuccessful tenderers will be returned after contracts are awarded.

Performance Bonds shall be furnished at Owner's option and expense, by the successful tenderers.

The Owners reserve the right to reject any or all tenders.

Drawings and Specifications may be seen at Registrar's Office, Queen's University, Kingston, and at Builders' Exchange, Toronto; or they may be had upon deposit of $15.00 for their safe return by applying to the Architects.

SHEPARD and CALVIN,
36 Toronto Street,
48 TORONTO.

Toronto General Hospital

TENDERS

will be received by the undersigned till 12 o'clock noon,

December 15th,

for all the various trades required in the erection and completion of an extension to the Toronto General Hospital, Out Patients Department, University Avenue and College Street.

Plans and specifications may be seen and any other information obtained at the office of the Architects.

The lowest or any tender not necessarily accepted.

To receive consideration all tenders must be submitted on Form of Tender to be obtained from the Architect' office.

DARLING & PEARSON, Architects,
48 2 Leader Lane, TORONTO.

Wanted

Cyclone Well Drill to handle 4¾ inch stem, 20 feet long. Law Construction Company, Toronto. 47-48 Fv.

Machinery for Sale

1—reversible builders hoist.
1 6-H.P. Ideal gas engine.
1 double cage builders elevator 75 foot lift.
1 pole derrick.
1 No. 6 London Concrete mixer.
1 5-H.P. electric motor.

W. J. Hickey,
47-48 119 East Main St., Welland

Wider Use of Canadian Coal

Some valuable suggestions, in connection with the fuel situation in Canada, are contained in an interim report recently issued by the Dominion Fuel Board, which has been formed to study the underlying causes of coal shortages and methods by which they may be counteracted. The report of the Board, of which Charles Camsell is chairman, lays stress on the necessity of dispensing with the use of anthracite and the advisibility of using Canadian coal so as to be independent of the United States as far as possible. The report urges the more general use of Alberta coal and the establishment of coking plants in the Dominion in order to utilize, to the best advantage, the large deposits of bituminous coal in Canada and the United States.

Residences

(Continued from page 53)

000, south side Cranbrook Ave., near Elm Road. Heating and electric to be let. Carpentry, plastering and painting by day labor.

Excavation work is to start for 2 residences, $4,500 each, north side Mahonley Ave., near Weston Rd. R. Young, 390 Quebec Ave., is owner and builder. Plastering, heating, painting, electric and plumbing trades to be let.

T. Robinson, 11 Evelyn Crescent is the owner and builder of 2 residences, $9,000 each, east side May Ave., near Weatherall. Plastering, electric, painting, heating and plumbing to be let.

Foundations are going in for 2 residences, $6,000 each, east side Lauder Ave., near Rogers Rd. Law & Smith, 326 Lauder Ave., are the owners and builders. Plastering, electric, painting, heating and plumbing to be let.

Tenders are being received on plastering, painting, plumbing, electric and heating on $15,000 residence being built west side Dovercourt Rd., near Bloor. Owner is Dr. W. M. Robb, 740 Dovercourt Road.

Westmount, Que.

Foundations are in for 4 pair residences, $30,000, on Prince Albert Ave. J. Hand, 4857 Sherbrooke Ave., is owner and builder. Millwork, roofing, electric and tiling to be let.

Windsor, Ont.

Excavation work is being done for $8,500 duplex residence on Victoria Ave. Owner and general contractor is J. J. McCloskey, 1701 Giles Blvd. Plastering, electric and plumbing to be let. No material purchased.

L. D. Galloway, 357 Windermere Rd., is the owner and general contractor of one $7,000 and one $7,500 duplex residence being built on Gladstone Ave. Plumbing, plastering and electric to be let. No material purchased.

G. Murray, 1018 Elsmere Ave., is owner and general contractor of $7,500 duplex residence being built on Elsmere Ave. Painting, plastering, heating, electric and plumbing to be let. No material purchased.

CONTRACTS AWARDED

Cooksville, Ont.

The following sub-trades have been let on 3 residences, $5,000 each, being built on Centre Rd. N.; electric, heating and plumbing—H. V. Moore, Cooksville; plastering—Mr. McGinty, Port Credit. A. H. Forster, 279 Indian Rd., Toronto, is the owner and builder.

Ford, Ont.

L. T. Beno, 85 Ellrose Ave., is the general contractor for $6,200 residence being built on Dawson Rd., for J. G. Lafortune, 103 Drouillard Rd. No material purchased.

Hamilton, Ont.

The walls are going up for $20,000 residence, corner Queen and Glenfern, for Robt. Mills, Queen St. S. Following sub-trades have been let: plastering—Hannaford Bros.; painting—O. H. Holcombe, 160 Markland St.; electric—W. R. Kinney, 71 Lorne Ave; plumbing and heating—Adam Clark, 7 Main St. W. General contractors are Mitchell & Riddell. Architects Hutton & Souter.

Montreal, Que.

The following sub-trades have been let on $18,000 cottage being built on Girouald Ave., brickwork—M. Tranchemontagne, roofing—Jos. Lanctot, electric—O. Labelle, plumbing and heating—Belisle & Freres, Ltd., plastering—J. O. Nantel, painting and glazing—R. Letremiere, tiling—H. Capra. J. Deslauriers, 700 Girouald.

Following sub-trades have been let on $10,000 residence being built on Victoria Ave., for J. K. L. Ross, 107 St. James St.; millwork—Wm. Rutherford, 425 Atwater Ave., electric—H. R. Cassidy, 255 Regent; plumbing and heating—Whyte & Ware; tiling—Brown & Son, plastering—K. C. Dibau; painting—John Croft. Masonry, carpentry and roofing by general contractors, L. A. Ott & Co., Ltd.

The following sub-trades have been let on 2 residences, $20,000, being built on Mire Ave. for J. K. L. Ross, 107 St. James St.; electric—H. R. Cassidy, 225 Regent St.; plumbing and heating—Whyte & Ware; plastering—K. C. Diau; painting and glazing—John Croft; tiling—Brown and Son; masonry, carpentry and roofing by general contractor, L. A. Ott & Co., 10 Cathcart Ct.

Vezina & Dugal, 849 Mary Ann E., have the general contract for $12,000 cottage being built on Delorimier, near Sherbrooke, for Jos. Lachapelle; 59 Kent. Brickwork, roofing, millwork, electric, plumbing, heating, plastering, painting and glazing, and tiling to be let.

Work is to start at once for $12,000 residence on Jeanne D'Arc, near C.N.R. tracks for T. Paquette, 451 Drolet St. General contractors are La Corporation Des Logements Ouvriers, Ltd. Carpentry, millwork, roofing, electric and plumbing to be let. Excavation and masonry by general contractors. Plastering and painting by day labor.

The following sub-trades have been let on $35,000 residence being built on St. Joseph Blvd., between Fabre and Garnier; brickwork—Theode Frenette, 615 Garnier; millwork—H. Chagnon & Cie; roofing—M. Chouinard, 751 Adam; electric—J. A. St. Amour, 2171 St. Denis; plumbing and heating—Jas. Francoeur & Cie; plastering—G. Rochefort, 273 Valois. Painting and glazing day labor, by owner and builder, U. Boileau, 565 Garnier. Marble, tiling and ornamental iron stairs and balconies to be let.

Following sub-trades have been let on $36,000 residence being built on Mire Ave., Notre Dame de Grace, for Sir Herbert Holt, 83 Craig St. W., and 3 residences, $30,000, being built on Glencairn Ave., for Est. D. Williamson: millwork—Wm. Rutherford & Sons; electric—H. R. Cassidy, 255 Regent St.; plumbing and heating—Whyte & Ware; tiling—Brown & Son; plastering—K. C. Dibau, care general contractor; painting and glazing—John Croft, care general contractor, L. A. Ott & Co., 10 Cathcart St. Masonry, carpentry and roofing by general contractor.

R. D. Clarke & Sons, Ltd., 26 Lincoln St., have the contract for plastering in connection with $12,000 repairs to residence at 715 Pine Ave. W. J. H. Birks, 715 Pine Ave. W. is the owner. Reid Bros., 2a Tower St., are the general contractors.

[illegible] Mance [illegible] Mance [illegible] Mance [

Eaman, Monkland Ave. 4,000 bricks and material for 36 cu. yds. concrete and 2,000 sq. yds. plaster required. No material purchased.

J. B. Danst, Carleton, Ont., has the general contract for altering shop to apartments, $11,000, on Arlington Ave. 6,500 bricks and material for 27 cu. yds. concrete and 25,000 sq. yds. plaster required.

The walls are going up for $12,000 residence on Carling Ave., for Margaret A. Holloway, care general contractor, C. N. Hollister, 511 Bay St. Following sub-trades have been let: electric—Wallace Chugg, Bank and Second Ave.; plumbing and heating—McKinley & Northwood; plastering—Davis & Daly; painting—G. Green, Bank and Fourth Ave.

Quebec, Que.

T. F. Rousseau, 12 Fifth St., Limoilou, has the general contract for $9,000 residence to be built on Des Braves St., for J. D. Sutherland, 95 Claire Fontaine St.

Sarnia, Ont.

D. W. Griffin, Durand St., is the general contractor for $9,000 residence on London Rd. for Chas. H. Hanson, 257 S. Christina St. Masonry—Thos. Grace; millwork—Laidlaw Belton Lumber Co.

S. Vancouver, B. C.

Stewart & Coltart have the general contract for $15,000 residence on River Rd., for Mrs. E. S. McLennan, 1995—19th Ave. W., South Vancouver. Townely & Matheson, 325 Homer St., Vancouver, are the architects.

Government Bonds for Contractors

During the winter season many of our contractors buy short dated bonds to keep their funds employed.

Call us and let us explain

MAIN 3476
MAIN 0924

Established 1913

Special Toronto Representatives

Fidelity Insurance Co. of Canada

FIDELITY AGENCY OF CANADA LIMITED

Three Rivers, Que.

Jos. Lacroix, 10a St. Oliver St., is the general contractor for $10,000 semi-detached residence on St. Louis St., for Quebec & Ontario Bond & Mortgage Co. Masonry, electric, plumbing and plastering to be let.

Toronto, Ont.

The following sub-trades have been let on $15,000 residence being built on Russell Hill Rd., near Frybrook Rd.; electric—E. Addy, 128 Victor Ave.; plumbing and heating—A. E. Prouse, 38 Duggan Ave.; painting—T. Lane & Co., 109 Bloor West. Tiling and plastering to be let. A. R. Burk & Co., 18 Toronto St., are the architects.

The following sub-trades have been let on $8,500 residence and garage at 561 Durie St.; electric—J. Ritchie, 718 Annette; plumbing and heating—T. B. Smyth, 122 Avenue Rd.; plastering—J. Chapple, care owner and builder, R. C. Sutherland, 717 Annette St.

E. Waite, 745 Euclide Ave., has the general contract for $20,000 duplex residence on east side Bryce St. and will let plastering, plumbing, electric, heating and painting trades. No material purchased. General contractor buys.

J. Hopkins, 19 Westbrook Ave., has the contract for masonry on 2 residences, $4,000, on Meagher Ave., near Orley Ave. C. May, 498 Main St., is owner and builder and will let painting, heating, plumbing, plastering and electric trades. Carpentry, owner, day labor.

The walls are going up for $10,000 residence and garage west side Palisades Ave., near Ellis Ave., for A. B. Chapman, 1162 Queen West. I. J. Kent, 56 Kennedy Ave., is the general contractor.

The following sub-trades have been let on 4 pair residences, $7,000 each, being built west side Coxwell, below Danforth Ave.; electric—T. B. Kilner, 601 Jones Ave.; plumbing—W. J. Merrill, 862 Kingston Rd.; heating—Toronto Furnace Co. Painting day labor by owner, F. C. Lankin, 223 Fulton Ave.

Chas. Hough, 43 Playter Blvd., is the general contractor for $8,000 residence being built at 24 Glencairn Ave.

The following sub-trades have been let on 1 pair residences, $8,000, at 89-91 Woodington Ave.; electric—Taylor Bros.; plumbing—Hill & Whalaker; heating—Howard Furnace Co.; painting—A. M. Simmons, 612 Jones Ave. Plastering to be let. Jno. McMaster, 244 Chisholm Ave., is the owner and builder.

W. W. Petley & Co., have the general contract for $30,000 residence to be built on Highland Ave., for Mr. Wilkes, care architects, Waters & Wilkes, 43 Scott St.

Jas. A. Shier, 17 Graham Road, has the contract for masonry work on $15,000 duplex residence, south side Grimthorpe Ave., near Atlas Ave. J. A. Griffin, 48 Vimy Ridge Ave., is owner and builder. Plastering, electric, painting, heating and plumbing to be let.

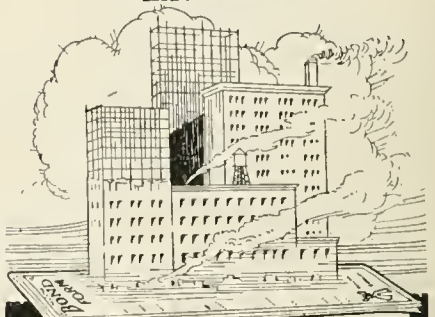
Tenders are being received by general contractors, Graham & Sibbett, 9a Wellington East, for tiling for bathrooms of $18,000 residence and garage, north side Austin Terrace and Lyndhurst Ave. Electrical work is being done by Geo. Campbell, care general contractors. Owner is A. E. McLean, 386 Bay St.

T. Robinson, 11 Evelyn Crescent, is the builder of 2 residences, $15,000, east side May Ave., near Weatherall, for A. Robinson, Weston P.O. Plastering, electric, painting, heating and plumbing to be let by builder.

The following sub-trades have been let on $50,000 residence being built on

WE WILL BOND AND INSURE YOU

Contract Bonds, Liability, Accident Insurance



UNITED STATES FIDELITY & GUARANTY Company

Total Assets ..... $37,491,355.

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36 Toronto Street, Toronto
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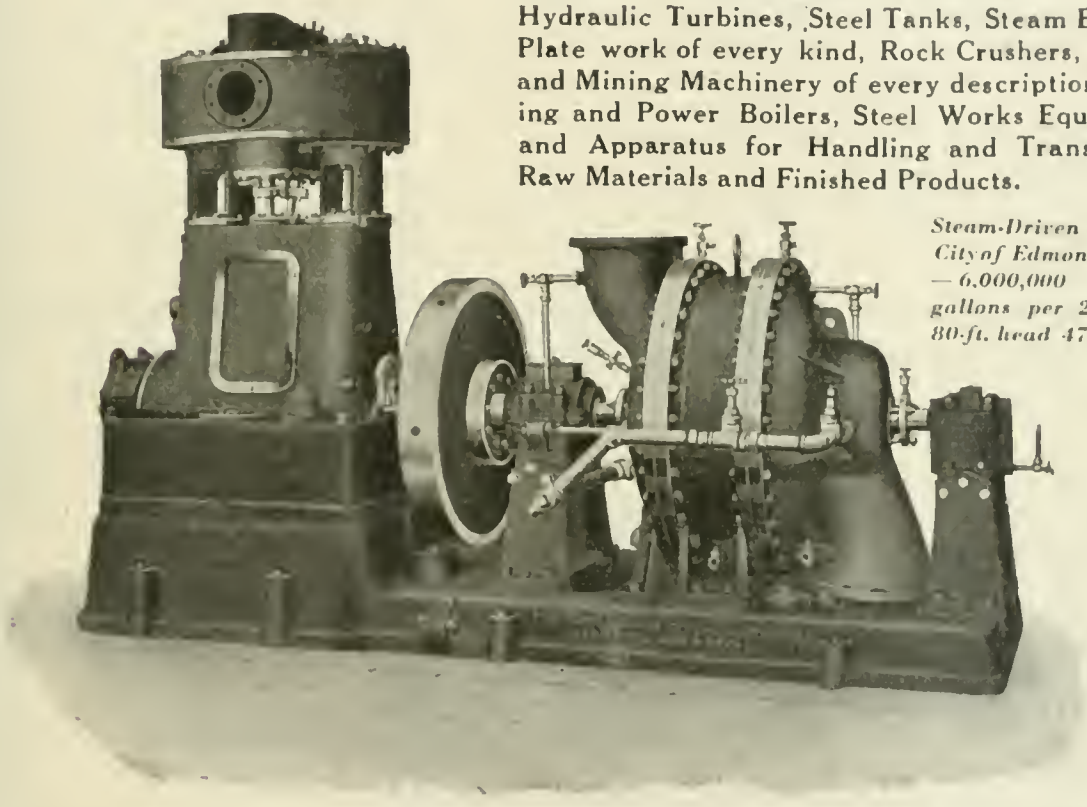

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Let us send you full particulars regarding the equipment in which you are interested. — No obligation involved

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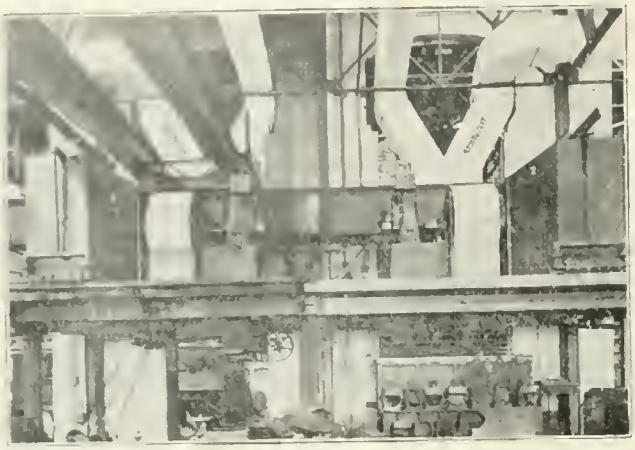
Engineers and Constructors
Since 1860



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especially if you have a heating and ventilating installation under consideration.

Our engineers are especially trained men and their successful experience embraces numerous installations in a wide variety of structures.

Folder 606 contains a review of the modern trend in Heating and Ventilating engineering and Sturtevant's contributions thereto.

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of Canada, Ltd.

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PUTS AIR TO WORK

Forest Hill Rd., for Clarence A. Bogart, care architect, J. M. Lyle, 230 Bloor W.; painting—Linnington Connell Co., Ltd.; plumbing and heating—McNaughton & McKenzie; plastering—Robertson & Findlay. Tiling to be let.

C. Strauss, 157 Bellwoods Ave., has the contract for plastering and R. McFadden, care owner, 766 Dundas W., has the contract for painting in connection with 5 residences, $12,000 each, being built west side Spadina Ave., near Austin Terrace.

Windsor, Ont.

E. P. Fox, 29 Indian Rd., Sandwich, Ont., is the general contractor for $8,500 duplex residence being built on Ouellette Ave., for Wm. Lanspeary. No material purchased.

J. & J. Ward, Dougal Ave., have the general contract for $8,500 duplex residence being built on Parent Ave., for J. A. Thibodeau, 820 Parent Ave. No material purchased.

Walkerville, Ont.

Contract for plumbing and heating $30 000 residence and garage being built for C. S. King, has been awarded to White Plumbing & Heating Co., at $5,640. Architects, Nichols & Sheppard, Windsor. E. G. Morley, 1340 Dougall Ave., Windsor, is the general contractor.

E. G. Morley, Dougall Ave., Windsor, Ont., has the general contract for $35,000 residence and garage being built for C. S. King, Chatham St. West, Windsor. Nichols & Sheppard, Windsor, are the architects.

Power Plants, Electricity and Telephones

Chelsea Falls, Que.

Riordon Co., Ltd., 355 Beaver Hall Hill, Montreal, contemplate building a power house on Gatineau River. Engineers in charge of work are Montreal Engineering Co., Ltd., 164 St. James St., Montreal. Contract for this work will be awarded shortly.

Mildmay, Ont.

Mildmay Electric Co. contemplates improving electric lighting system and is interested in prices of transformers.

St. Michael Des Saints, Que.

Toupin & Roi, 502 St. Catherine E., Montreal, contemplate an electric lighting system here.

St. Paulin, Que.

Algonquin Power Co., Montreal, Que., contemplate water power development on River Du Loup en Haut, estimated to cost $100 000. J. M. Robertson Ltd., 20 St. Nicholas St., Montreal, are the engineers.

Tidewater, N. S.

The Nova Scotia Power Commission has recently signed a contract with the Albany Perforated Wrapping Co., of Albany, N. Y., to furnish that company at West River, Sheet Harbor, with 4600 h.p. of electric energy. For the purpose of furnishing this power the commission will erect a second generating station on East River, Sheet Harbor. This station will operate at a head of about 100′ and will have an ultimate capacity of about 9000 h.p.

BURLINGTON STEEL COMPANY, LIMITED

HAMILTON CANADA

Specifications

A steel specification is a document for guidance to the manufacturer in producing an article, and a protection to the purchaser in accepting it. A specification should be written only after careful study of the production of the article, and an equally careful study of the use to which it is to be put.

Specification A-16-14, covering Rail Steel Bars, was issued by the American Society for Testing Materials only after the most careful investigation that has ever been made of any reinforcing material. In 1913, Professor W. K. Hatt, then of Purdue University (now on Mr. Hoover's staff) made over 3,000 tests on as many samples obtained under normal working conditions from four separate mills. Professor Hatt found that Rail Steel Bars had unusual strength, and furthermore, "excess ductility for its strength above usual grades of steel."

Specification A 16-14 is, therefore, everything that a specification should be. It is a protection to the purchaser. It asures him of getting Rail Steel Bars, proven by over 3,000 tests to have a quality factor (strength and ductility) in excess of usual grades of steel. This specification at the same time prevents any substitution of undesirable re-rolled

Specify your reinforcing steel to meet A.S.T.M. specifications A-16-14, or equal

You will be interested in the facts contained in this valuable book. A copy is yours for the asking.

Burlington Reinforcing Bars used in construction of Warehouse for Crane Limited, Toronto, erected 1922

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Wm. Steele & Sons, Architects

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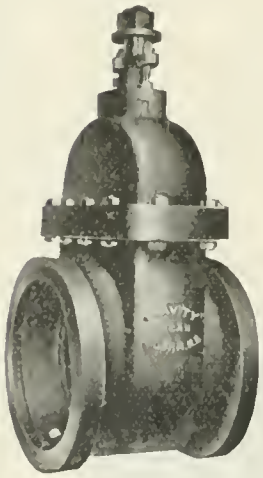
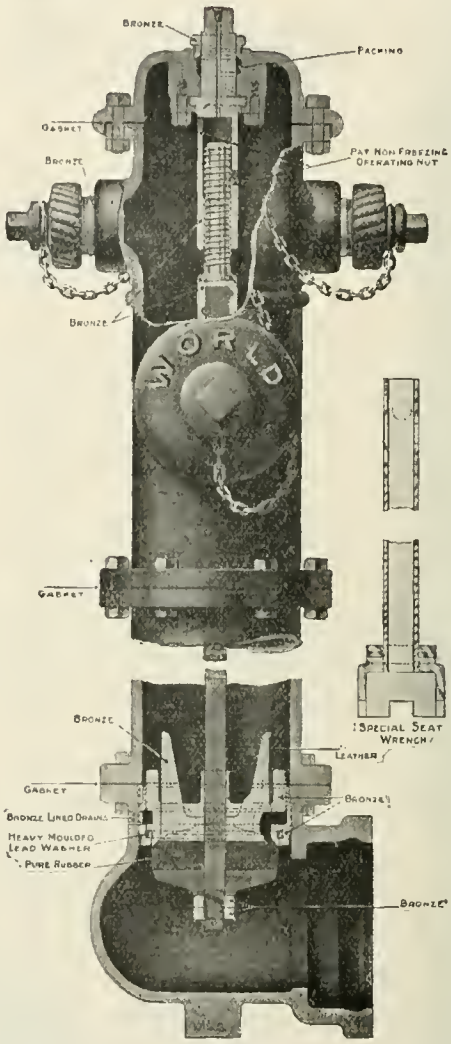


Catalogs, prices and full details are yours for the asking.



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BOOKS
for Engineers and Contractors

The following Books are Offered subject to Previous Sale.

"Elasticity and Strength of Materials Used in Engineering Construction," Section 1, by C. A. P. Turner. Published in 1922, 85 pages, illustrated. Price $5.00.

"Elasticity and Strength of Materials Used in Engineering Construction," Section 2. Theory of Simple Flexure recently published by C. A. P. Turner, C.E., price $5.00.

"Elasticity and Strength of Materials Used in Engineering Construction," Section 3. Theory of Torsion in Shafting and Double Bending of Plates, recently published by C. A. P. Turner, C.E., price $5.00.

"Estimating Building Costs," by Charles F. Dingman, first edition, published by McGraw-Hill Book Company, Incorporated. 240 pages. Price $2.50.

"Hand Book of Hydraulics," by Horace Williams King 1st edition published by McGraw-Hill Book Co., Inc. 421 pages. Price $2.50.

"Operation and Maintenance of Irrigation Systems," by S. T. Harding. First edition, published in 1917 by the McGraw-Hill Book Co., Inc. 271 pages, illustrated. Price $1.50.

"Practical Road Building," by Charles E. Foote. Just published by David McKay, 295 pages, illustrated. Price $1.50.

"Reinforced Concrete Construction", Volume 1, by George A. Hool, S. B. Second edition, published in 1917, 254 pages, illustrated. Price $2.50.

"Relief from Floods." The Fundamentals of Flood Prevention, Flood Protection and the means of determining proper remedies. By John W. Alvord and Charles B. Burdock. First edition published in 1918 by McGraw-Hill Book Co., Inc. 175 pages, illustrated. Price $1.00.

"Sheet-Metal Pattern Drafting and Shop Problems," by James S. Daugherty. Published in 1922 by The Manual Arts Press, 173 pages, illustrated. Price $2.50.

"Steel Bridge Designing," by Melville B. Wells, C.E. Published by Myron C. Clark Publishing Company in 1913. 260 pages, illustrated. Price $1.00.

"Use of Water in Irrigation," by Samuel Fortier. Published in 1915 by McGraw-Hill Book Company. 265 pages, illustrated. Price $1.50.

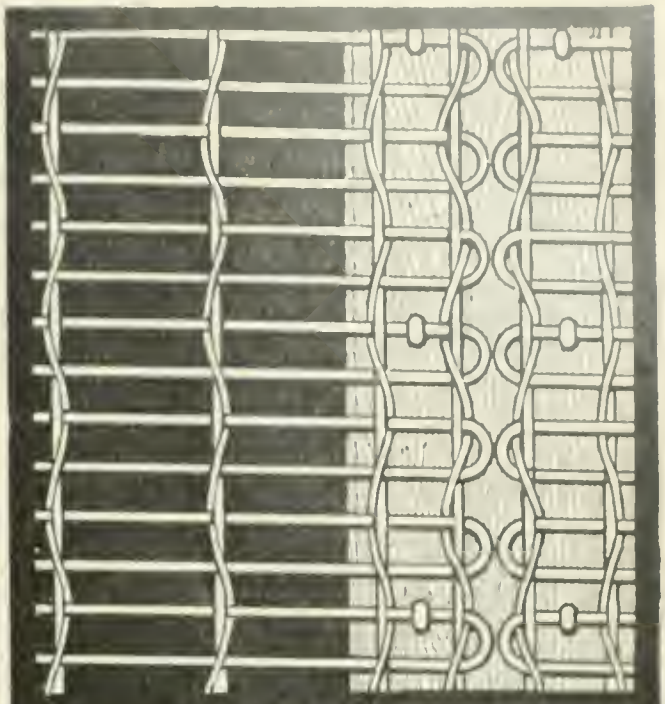
"Use of Water in Irrigation," by Samuel Fortier. Second edition. Published by McGraw-Hill Book Company, 1916. 325 pages, illustrated. Price $2.00.

"Water Purification," by Joseph Ellms. Published in 1917 by McGraw-Hill Book Company. 485 pages, illustrated. Price $3.50.

"Collected Papers On Acoustics," by Wallace Clement Sabine just published by the Harvard University Press. Price $3.50. 280 pages, illustrated.

"Practical Accounting for General Contractors"—by H. D. Grant. Published in 1922 by McGraw-Hill Book Company Incorporated, 254 pages. Price $3.00.

Contract Record
347 Adelaide St. West, Toronto, Ont.



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"Truss" construction prevents buckling when lathe is unrolled. Lays flat. Requires no lacing at edges over studs and joists Can be placed over sheathing without furring. The truss construction raises every other wire off the joist thus providing a perfect key to the plaster even at the joists

Thoroughly embedded in the plaster and thus absolutely protected from corrosive effects of the atmosphere. Rust does not attack the rounded wire as it does the thin edge of sheet metal fabric.

Readily bent and formed into shape with minimum cutting. Stock width 32" and 36", rolls 105' long.

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Current Prices of Building and Engineering Materials

	Toronto	Montreal	Winnipeg	Vancouver
CEMENT (Delivered on job):—				
Retail lots including bags, delivered .....per bbl.	$4.60	$4.16	$5.00	$4.30
Car lots, including bags, f.o.b. siding .....per bbl.	3.45*	3.48	4.20	4.20
Refund on bags .....each	.20	.20	.20	.20
LIME				
Lump, in retail lots, delivered .....per ton	14.30	13.00	.58 bu.	2.70 bbl
Lump, in car lots f.o.b. siding .....per ton	11.80	9.50	13.80 ton*	2.60 bbl
Hydrated, white in retail lots, delivered .....per ton	20.00	26.00	.63 bag†	22.00
Hydrated, white in car lots, f.o.b. siding .....per ton	18.00	21.00	.56 bag†	18.00
Hydrated, grey in retail lots, delivered .....per ton	18.75	19.00		
BRICK and TILE (Delivered on job):—				
Common face brick .....per M.	24.00	16.50*	19.00	23.00
No. 1 dry pressed brick .....per M.	30.00	30.00	36.00	65 00
No. 2 dry pressed brick .....per M.	28.50	25.00	32.00	
Enamelled brick .....per M.	125.00 up	180.00	185.00	150.00
Wire cut brick, for foundation work .....per M.	21.00	19.00		40.00
Sand lime brick .....per M	17.00		18.00	19.00
Hollow building tile .....per M.			8-12c. per ft.	105-240,00
Paving brick imported .....per M.	on appl.	100.00	55.00	60.00
Fire brick .....per M.	68-95	60-75	85-100	70.00
Fire clay .....per ton	13-20	15-16.00	35.00	20.00
STONE, SAND and GRAVEL (f.o.b. cars on siding):—				
Crushed stone, 2 in. .....per ton	2.05**	1.80	2.45 yd.*	$2.75 yd.
Crushed stone, 1 in. and under .....per ton	2.31	1.90	2.75 "	" "
Crusher run .....per ton	2.20½		3.00 "	" "
Rubble stone .....per ton	2.45	1.70	15.00 cord	" "
Gravel, 2 in. screened .....per ton	1.84		2.45 yd.	" "
Gravel 1 in. screened .....per ton	2.05	1.50	2.75 "	" "
Sand, screened .....per ton	1.26½	1.25	1.90 yd.	2.50 yd.
Pit run .....per ton	1.52¾	1.25	1.90 "	" "
STEEL and IRON (f.o.b. warehouse):—				
Mild steel bars, ¼ in. and heavier .....per 100 lbs	3.90 base†	4.00 base	4.90	4.00
Bands 3/16 in. and lighter .....per 100 lbs	4.40 "	4.50 "	5.40 base	
Hoops .....per 100 lbs	5.00 "	5.00 "		
Angles, channels and tees under 3 in. .....per 100 lbs.	4.50 "	4.00 "	5.45	6.00
Structural shapes .....per 100 lbs.	4.25 "	4.25 "	5.35 base	6.00
Plates—¼ in. and heavier .....per 100 lbs	3.75 "	3.90 "	5.45	6.25
Plates—3/16 in. .....per 100 lbs	4.25 "	4.25 "	5.85	6.50
Plates—10 gauge .....per 100 lbs.	4.60 "	4.50 "	6.15	6.50
Black sheets—28 gauge .....per 100 lbs.	5.45 "	5.00 "	6.50	8.25
Galvanized sheets—28 gauge .....per 100 lbs.	6.50 "	7.00 "	7.85	9.35
Galvanized Corrugated sheets—28 gauge .....per 100 ft.	7.00 "	7.00 "	7.70	8.25-8.50
Rivets .....per 100 lbs.	6.25 "	6.00 "	7.50 base	
Cast iron pipe .....per ton	67.50	60.00 "		
VITRIFIED CLAY PRODUCTS (Delivered on job):—				
Sewer pipe, 4 in. .....per ft.	.40	.30	.35	.25
Sewer pipe, 6 in .....per ft.	.60	.45	.40	.35
Sewer pipe, 8 in. .....per ft.	.80	.70	.60	.45
Sewer pipe, 9 in. .....per ft.	1.00	.85	.70	.60
Sewer pipe, 10 in. .....per ft.	1.20	1.05	.80	.55
Sewer pipe, 12 in. .....per ft.	1.50	1.35	1.00	.65
Sewer pipe, 15 in. .....per ft.	2.25	1.80	1.85	.95
Sewer pipe, 18 in. .....per ft.	3.00	2.50	2.45	1.50
Sewer pipe, 21 in. .....per ft.	4.00	3.00		1.90
Sewer pipe, 24 in. .....per ft.	6.00	4.50	3.75	3.10
Tile wall coping, 8 or 9 in .....per ft.	.60	.50		.50
Tile wall coping, 12 or 13 in. .....per ft.	.90	.75		.60
Flue lining, 8½ x 8½ in. .....per ft.	.70*	.60	.55	.40
Flue lining, 8½ x 13 in. .....per ft.	1.00*	.90	.65	.75
Chimney tops .....each	9.00	14.00	7.50	4.50–6.00
Discounts	45 % truck lots 50 % car lots	20 % 50 %	5 %	

CEMENT —*Discount of 10 cts. per bbl. in 20 days from date of shipment.
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STEEL:—†Extras in various steel lines were alvanced recently. New list may be hal on application to dealers.
VITRIFIED CLAY PRODUCTS:—.Discount on flue linings is 55%

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DEPARTMENT OF LABOUR
BOILER INSPECTION NOTICE

Excerpt from Regulations for the Construction and Inspection of Boilers

Section 300

No Boiler which has been in use for two or more seasons shall be sold or exchanged for subsequent use as a Boiler unless it is accompanied by an inspection certificate issued by the Department within one year preceding the date of such sale or exchange. The allowable working pressure for such Boiler shall be determined by the Inspector from the formulæ contained in the regulations, with such deductions in pressure for depreciation as the Inspector's judgment shall dictate.

The travelling expenses in connection with the inspection of Boilers sold, exchanged or extensively repaired, must be paid by the owner or purchaser of such Boilers, together with the inspection fee of five dollars.

All communications should be addressed to the Steam Boiler Branch, Department of Labour, Spadina Crescent.

HON. Dr. FORBES GODFREY,
Minister of Labour.

D. M. MEDCALF, Chief Inspector of Steam Boilers.

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C.N.R. & C.P.R.	C.N.R. & C.P.R.	C.P.R.

CURRENT PRICES OF BUILDING AND ENGINEERING MATERIALS—continued

Lumber (Delivered on job):—	Toronto	Montreal	Winnipeg	Vancouver
Flooring, 1 x 3 and 4 in., clear, E. G. fir ....per M.	100.00	60.00	80.00	63.00
Flooring, 1 x 3 and 4 in., clear, F. G. fir ....per M.	75.00	65.00	56.00	43.00
Flooring, No. 1 pine ....per M.	75.00	80.00		
Flooring, No. 1 Spruce ....per M.	52.00	45.00		
Flooring, birch and maple, 13/16 in. clear ....per M.	130.00	110.00	156.00	200.00
Flooring, plain red oak, ⅜ in. clear ....per M.	120.00	125.00	136.00	265.00
V joint, 1 x 3 and 4 in., Nos. 1 and 2, clear, fir ...per M.	75.00	65.00	56.00	45.00
V joint, No. 1 pine ....per M.	75.00	85.00	63.00	
Pine, 1 x 4 to 12 in., common rough ....per M.	46/61	45.00	40.00	
Red and Jack Pine, 2 x 4 to 12 in., com. rough per M.	48/58	70.00	36.00	
Hemlock, 2 x 4 to 12 in. ....per M.	43/48	40.00	36.00	11.50-18.75
Fir, 1 x 4 to 12 in. No. 1 common, D 1 S ....per M.	40–50.00	50.00	35.20	20.00/25.00
Spruce, 1 and 2 x 4 to 12 in. ....per M.	48/60	45-35	36.00	
Timbers, fir, 10 x 10 in. and up ....per M.	65.00	58.00	53.60 base	17.-22.00
Lath, No. 1 white pine ....per M.	13.50	12.00	11.20	
Lath, M. R. spruce ....per M.	9.50	8.50	8.40	7.00
Shingles, XXX B.C. cedar ....per M.	6.25	5.00	5.60	3.25
XX B.C. cedar ....per M.	4.50	4.25	3.20	1.90
N.B. extras ....per M.	6.50	6.75		
N.B. clears ....per M.	6.00	5.50		
Pine casing ....per M.	1 ct. per in.	95.00	115.00	55.00
Fir casing ....per M.	1¼ ct. per in.	100.00	105.00	70.00
PAINTS, OILS, COLOURS (delivered):—				
White lead ground in oil, less than ton lots ....per cwt.	13.25	14.60	15.60	16.30
Red lead, dry, small lots ....per cwt.	17.00	9.55	22.00	16.00
Putty in bulk ....per cwt.	5.95	4.25	5.25	7.75
Steel sash putty in bulk ....per cwt.	6.45	6.00	8.00	7.75
Boiled linseed oil, in bbls. ....per gal.	1.23	1.40	1.30	1.46
Raw linseed oil, in bbls. ....per gal.	1.20	1.38	1.33	1.43
Turpentine, in bbls. ....per gal.	1.55	2.20	1.70	2.25
Mortar Color, maroon, in bbls. ....per lb.	.02¼		.06 9/10	6.45 per cwt.
Mortar Color, black, in bbls. ....per lb.	.08		.06 4/5	.45
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Hard wall plaster, sanded ....per ton	13.50	15.00	26.00	26.00
Plaster of paris, in bbl. lots ....per bbl.	5.50	5.35	1.60 bag*	7.50
Plasterers' hair ....per bag	2.50	7½ cts. per lb.	1.00 bu*	-.50
LABOR:—				
Bricklayers ....per hr.	1.00	.80–.90	1.10	1.06¼
Structural Iron Workers ....per hr.	.85	.50–.75	.90	1.00
Plasterers ....per hr.	1.25	.80	1.07½	1.06¼
Hoisting Engineers ....per hr.	.70–.80	.50	.85-1.00	1.00
Plumbers ....per hr.	.90	.60–.75	1.00	.90
Carpenters ....per hr.	.90	.65	.85	.81¼
Painters ....per hr.	.75	.55–.65	.75	81¼
Electrical Workers ....per hr.	.80	.65	.65- .85	1.00
Roofers ....per hr.	.65	.65	.50	.90
Laborers (Common) ....per hr.	.40–.50	.30	.42½	.50-.56¼
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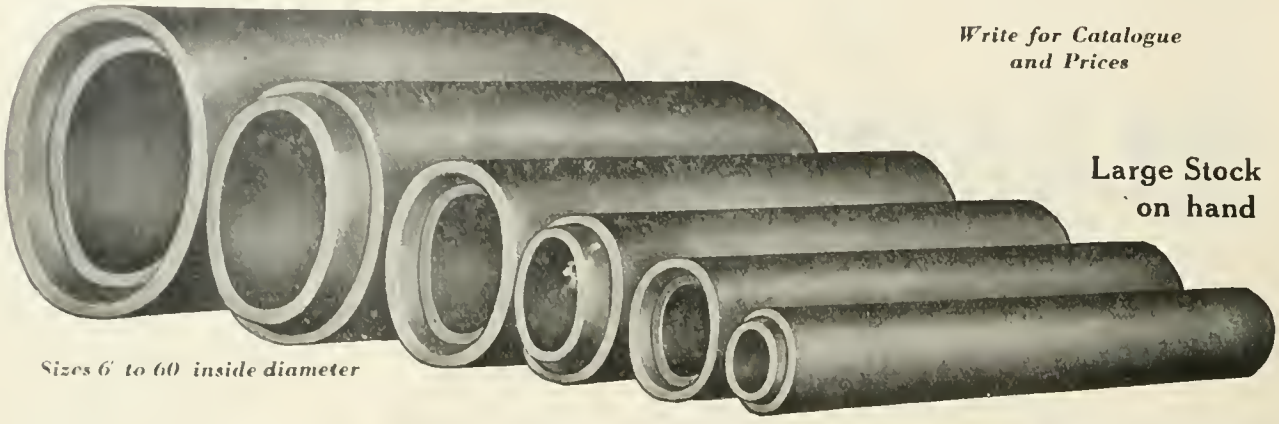

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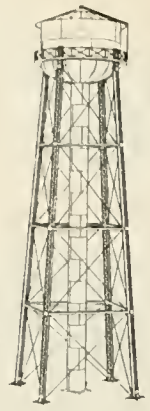

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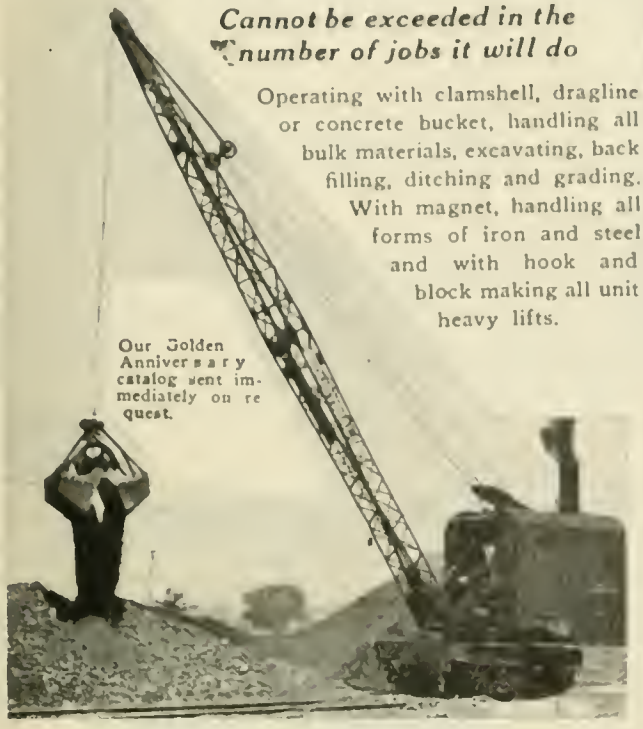

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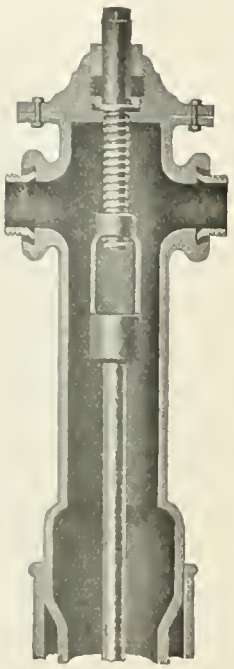

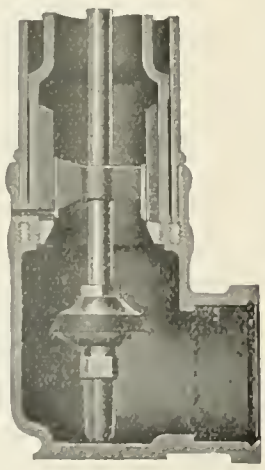

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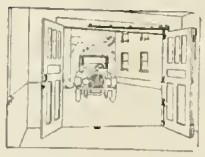

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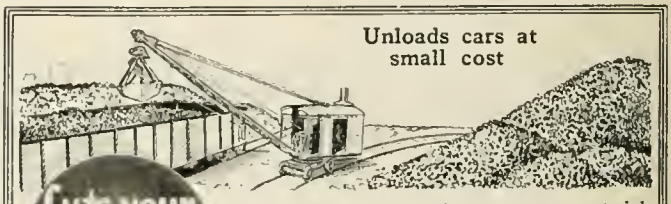

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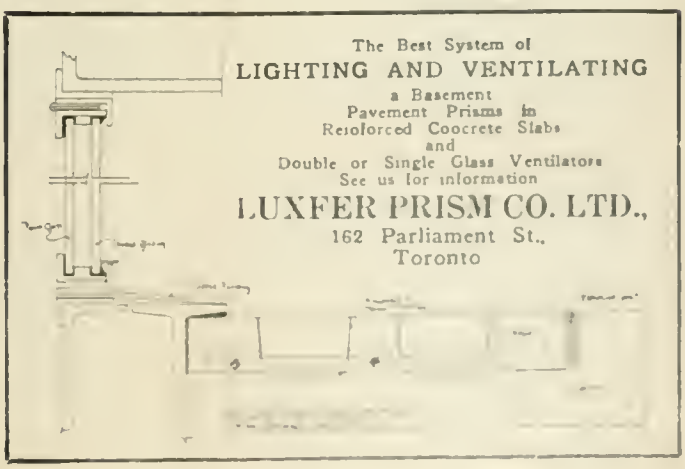

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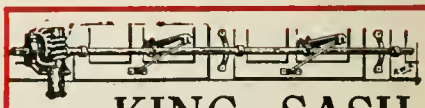
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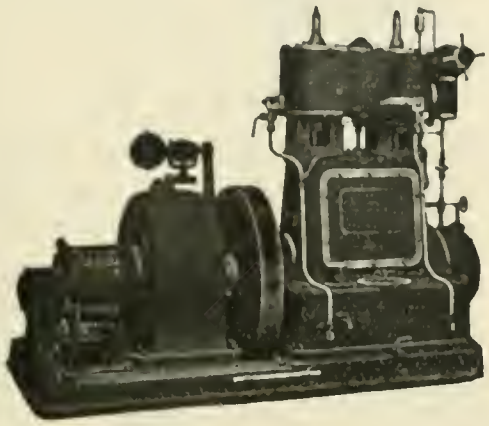

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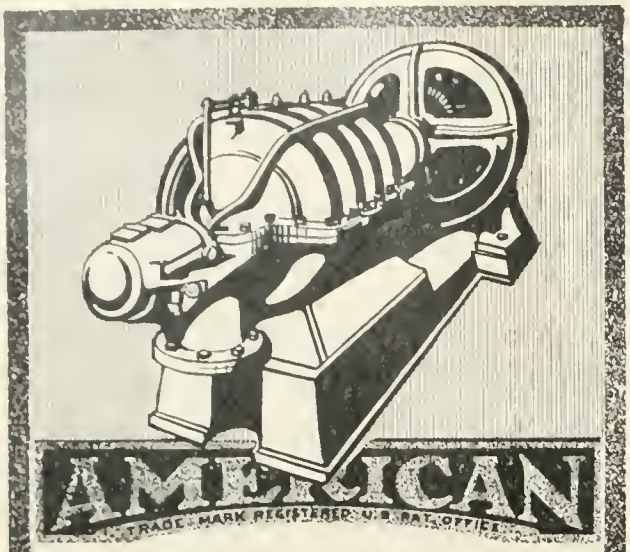

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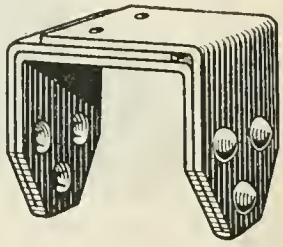

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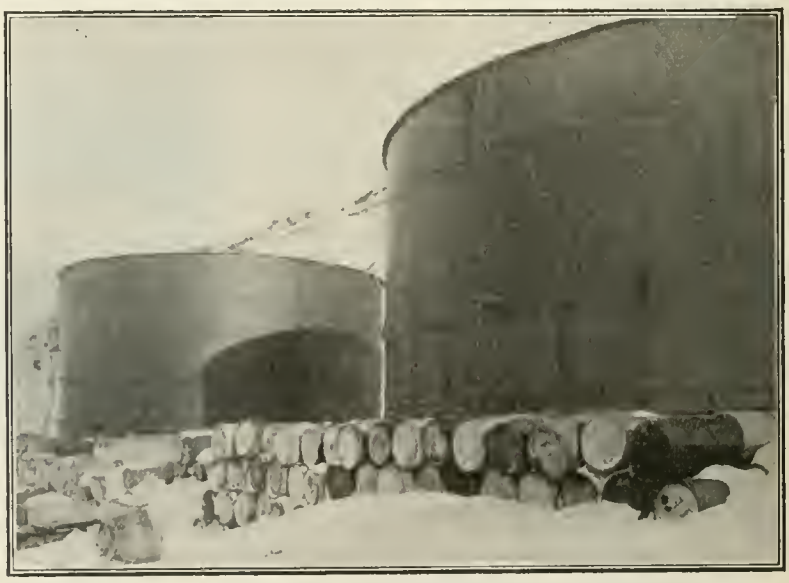

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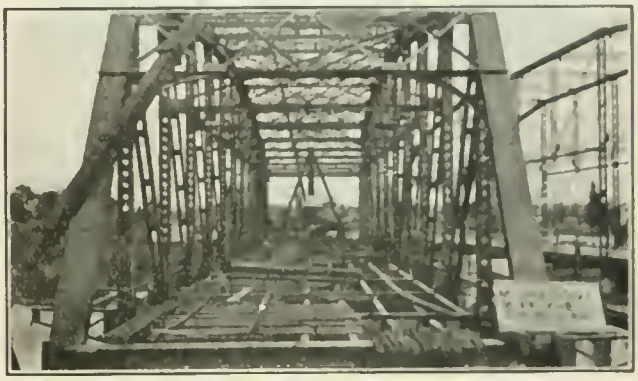

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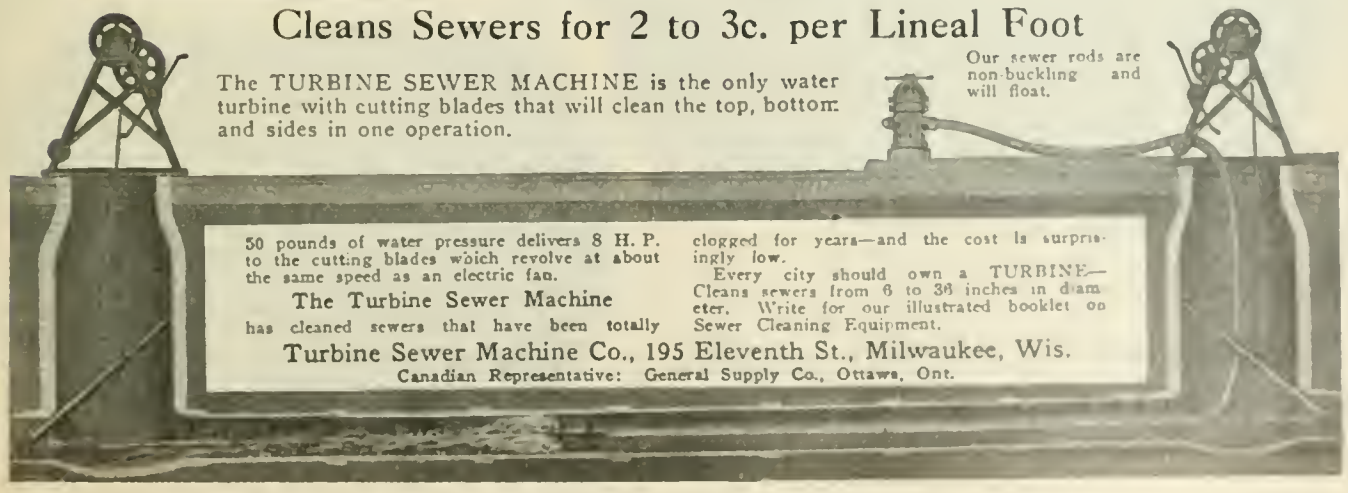

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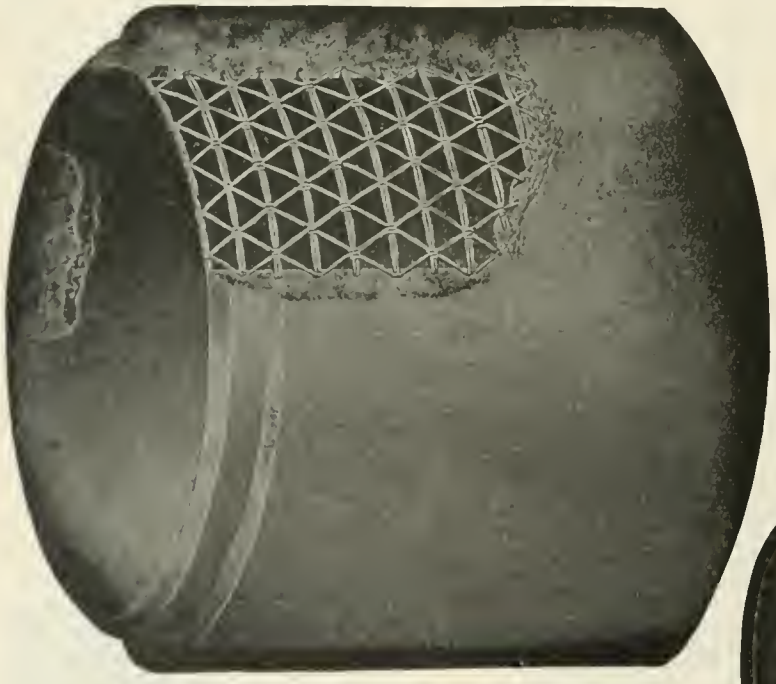

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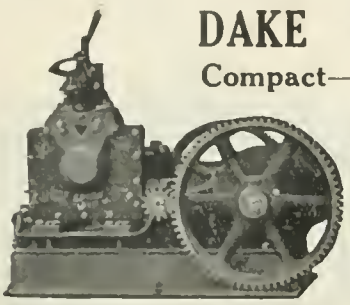

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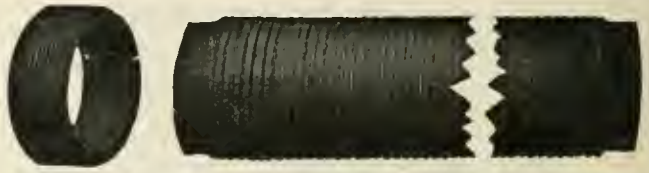

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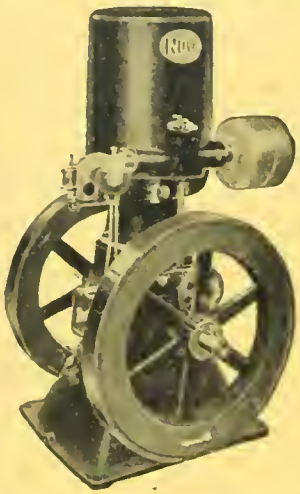

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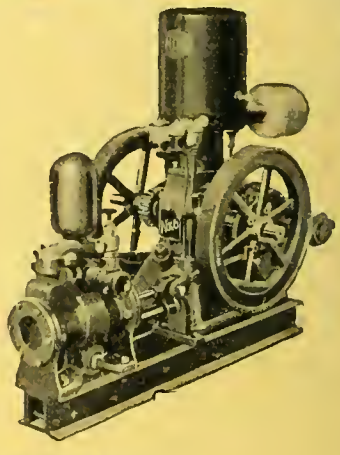

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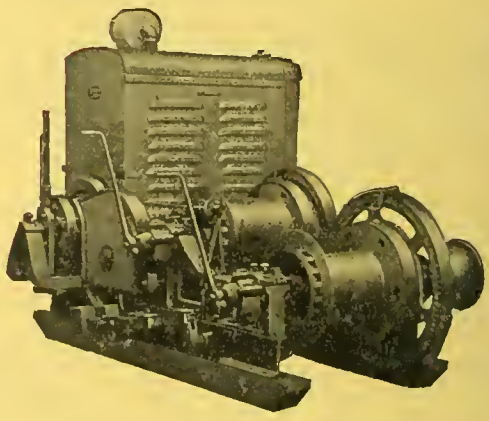

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